PROJECT DESCRIPTION

for Renewal of

DEPARTMENT OF THE ARMY

REGIONAL GENERAL PERMIT NO. 24460S

CARMEL RIVER MAINTENANCE AND RESTORATION PROJECTS

MONTEREY COUNTY, CALIFORNIA

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ATTACHMENTS

1.0 INTRODUCTION

1.1 Summary

The Monterey Peninsula Water Management District (MPWMD) seeks renewal of RGP 24460S from the U.S. Army Corps of Engineers (Corps) to allow MPWMD to continue to conduct routine maintenance and restoration activities within an 18.6-mile segment of the Carmel River from the Carmel River lagoon at River Mile (RM, measured from the ocean) 0 to the San Clemente Dam at RM 18.6, but not including the dam (**Figure 1 and Figure 2**)[1]. As in RGP 24460S, MPWMD is also seeking re-authorization from the Corps to act as an administrator for the permit on behalf of the Corps for projects conducted along the Carmel River by other parties, including private property owners, public and private entities, and non-profit organizations. If approved, the permit would allow up to approximately 0.7 miles of channel restoration activities in any single year and up to approximately three miles per year of vegetation management activities in any single year.

This document provides the information for agency and public review of maintenance and restoration activities undertaken along portions of the Carmel River in Monterey County, California. Proposed activities are a combination of components from the Carmel River Management Program conducted by MPWMD and aquatic habitat enhancement activities for steelhead and California red-legged frogs. The document is organized as follows: Section 1.0 provides an introduction to the project and information specifically requested in the most recent application for a Department of the Army Permit; Section 2.0 describes U.S. Army Corps of Engineers (Corps) jurisdictional areas; and Section 3.0 provides updated information concerning potential environmental impacts associated with the proposed project.

This document parallels the Project Application first developed in 1999 and amendments submitted to the Corps for Regional General Permit (referred to as RGP or Permit throughout this document) No. 24460S as much as possible. Significant changes between the original submittal and this one are noted either in footnotes or in the text.

1.1.1 Permit History

In November 2004, the Corps issued RGP 24460S, which was valid until November 2009. The RGP applied to a 17.3-mile reach of the Carmel River that contains more than 400 properties. Between 2004 and 2009, work was authorized at 28 sites. Most of the work involved vegetation management (26 sites) with hand tools to reduce the potential for bank erosion. There were two bridge maintenance projects and one major restoration project authorized. The total length of stream affected by vegetation management during the five year permit period was approximately 4,885 lineal feet. Approximately 250 cubic yards of fill were placed into the stream channel and approximately 200 cubic yards of material was removed from the stream channel along approximately 150 feet. There was no recorded take of either steelhead or California red-legged

[1] The limits of RGP 24460S were from Highway 1 (RM 1.1) to RM 18.6. MPWMD is proposing to include vegetation management, but not construction activities, in the lower 1.1 miles of the river up to Highway 1 with this permit application.

frogs as a result of authorized projects.

The river experienced erosion along about 400 feet of the stream between 2004 and 2009. In comparison to the period between 1978 and 1998, when bank erosion occurred along virtually every reach of the 15.5-mile alluvial section of Carmel Valley, the amount of bank erosion between 2004 and 2009 was remarkably low. This is likely due to three factors: 1.) about 35% of the streambanks have been hardened or otherwise altered to resist erosion – especially in areas most vulnerable to erosion; 2.) peak stream flows in the winter did not exceed the five-year return flow magnitude; and 3.) streamside vegetation along much of the river has recovered substantially from the effects of floods, drought, and groundwater extraction between the 1970's and 1990's. It should be noted that the lower five miles of the river, where summer diversions are concentrated, exhibit many signs of an unstable system (localized bank scour at low flows, areas with sparse vegetation on the banks, scour or infrastructure and previously installed erosion protection).

1.2 Project Description

With a few notable differences described below, this project description is similar to the Amended Project Description dated July 2003 for RGP 24460S, which can be downloaded at

http://www.mpwmd.dst.ca.us/programs/river/erosion_potential/COE_24460S/COE_24460S.htm

1.2.1 Overview

As in RGP 24460S, most projects included in this application can be permitted under the Nationwide permit program authorized by Congress or by individual permit; however, because two species found in the Carmel River (steelhead and California red-legged frog) are protected by the Federal Endangered Species Act, most activities authorized by the Corps in the channel of the Carmel River require formal consultation with the National Marine Fisheries Service (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) and the issuance of an incidental take statement. A typical formal consultation for each type of activity can take 135 days or more to complete. Such a process would frequently exceed the timeframe for identifying and carrying out routine maintenance and restoration activities in the Carmel River within a given water year. It should be noted that because the Carmel River is quite dynamic, the time between identifying that an activity should be carried out (normally, at the end of the rainy season in April or May) and actually carrying out the activity (shortly after the end of the rainy season) is often less than the time allowed for formal consultation (i.e., 135 days). An RGP establishes a process to allow both project sponsors and regulatory agencies to comply with requirements of the Clean Water Act and the Endangered Species Act while carrying out routine activities within a reasonable timeframe.

A desired outcome from securing a RGP is to simplify and streamline the permit process for project sponsors that are interested in carrying out the following types of activities:

- installing limited erosion protection in unstable, degraded areas;
- channel restoration in unstable areas;

- reestablishing riparian vegetation along stream banks and adjacent areas;
- fisheries enhancement projects;
- *California red-legged frog enhancement projects*[2];
- limited removal of vegetation and debris from the active channel;
- maintenance or repairs of previously authorized restoration projects (prior to issuance of RGP 24460S) and projects completed under RGP 24460S;
- *lowering or removal of levees*[3]

The objectives of this work are to restore and maintain bank stability and channel meanders in unstable areas, prevent resource degradation, and to reestablish or enhance riparian resources. Activities authorized under the RGP are designed to work together in a comprehensive approach to channel maintenance and restoration. Over the next several years, significant changes in the river environment may occur as a result of the proposed retrofit of the San Clemente Dam, from proposed water supply alternatives that, when completed, could drastically reduce Carmel River diversions (e.g., the Coastal Water Project), and proposed reductions in Carmel River diversions described in a Cease and Desist Order from the State Water Resources Control Board. Activities proposed for this RGP address a certain range of the dynamic behavior of the river; however, analysis of the effects of these activities on threatened species is based primarily on past experience and present river conditions. Reinitiation of formal consultation may be required if changes to the river and threatened species occur that are not considered for this RGP.

Erosion protection and channel restoration activities would likely occur in degraded areas, which in many cases exhibit three characteristics: 1.) little or no vegetation; 2.) steep or unstable streambanks; and 3.) large mid-stream gravel bars. Maintenance, enhancement, and vegetation modification activities may occur in channel areas with relative higher quality habitat. Proposed activities may require the use of heavy construction equipment in the channel and on the banks of the river. Construction techniques will be used that are compatible with weather and channel conditions and reduce or minimize impacts to sensitive species. Construction activities in the channel bottom and in sensitive streamside areas would be implemented primarily during low-flow periods (i.e., July 1 to October 31). Some activities such as planting and irrigation in the floodplain may be conducted during spring, summer, and fall. Annually, the maximum length of stream affected by restoration projects could be approximately 0.7 miles. Selective removal or modification of vegetation and debris would not exceed three miles in any single year.

It should be noted that the area downstream of Highway 1 is located in the California Coastal Zone and is under the jurisdiction of the California Coastal Commission. In this area, MPWMD is proposing to carry out only vegetation management activities. No streambank maintenance activities involving grading or alteration of the river channel is proposed within this reach.

[2] Proposed new activity not included in RGP 24460S.

[3] This is a change from RGP 24460S. However, in the initial project application for RGP 24460S, MPWMD proposed to include this activity. Because there were no areas proposed for levee removal, MPWMD subsequently withdrew this activity from the proposed list of projects. In 2008, the Big Sur Land Trust proposed to remove significant portions of the levee upstream of Highway 1 along the south side of the Carmel River as a floodplain enhancement project.

For MPWMD sponsored projects, MPWMD will be responsible for planning, design, environmental review, securing permits, construction management, restoration planting, irrigation system installation, monitoring, and project maintenance.

In addition to MPWMD-sponsored restoration projects, MPWMD would also act as an agent on behalf of the Corps for other public and privately sponsored projects that qualify for authorization under the Permit. MPWMD would assume the responsibility for screening applicants, conducting pre-project evaluations, and inspecting project sites before and after completion to ensure compliance with criteria outlined in the Permit. To facilitate non-MPWMD sponsored projects, MPWMD desires a permit that is severable, which will allow MPWMD to assign portions of the permit to individual property owners. MPWMD will enter into an agreement with each party proposing to do work in order to ensure compliance with Corps 404 permit conditions and the MPWMD standards.

Certain activities proposed in the RGP could affect federally threatened California red-legged frogs (CRLF) (*Rana aurora draytonii*) and steelhead (*Oncorhynchus mykiss*). A biological opinion (BO) concerning possible effects of most of these proposed activities on steelhead was issued by the National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) on March 12, 2004 (see 151422SWR01SR247:KAJ). A BO concerning possible effects of most of these activities on CRLF was issued by the U.S. Fish and Wildlife Service (USFWS) on January 2, 2004 (PAS 542.880.1125.[4]

Prior to MPWMD or an authorized agent carrying out any channel activity, NOAA Fisheries will review each individual project for consistency with the Federal Endangered Species Act (ESA) and will issue project-specific conditions and incidental take statements, if necessary. FWS will review an annual list of projects and may provide direction regarding protection of CRLF.

MPWMD will be responsible for the preparation of annual notification/compliance reports. These reports will contain information on all projects constructed under the RGP. Prior to carrying out activities in the channel, MPWMD will prepare project descriptions, schedules, maps, pre-construction photos, and habitat evaluations. During project work, MPWMD will inspect for compliance with RGP conditions. After completion of work, MPWMD will provide post construction photographs, estimates of quantities of fill placed and/or acreage of Federal jurisdictional areas affected, and evaluation for compliance with the RGP.

General information on the Carmel River and additional descriptions of proposed activities are included in the permit application package submitted to the Corps by MPWMD for Carmel River maintenance and restoration projects, dated May 20, 1999, and in additional information provided by MPWMD to the Corps and other regulatory agencies. In addition, guidelines for vegetation management and the removal of deleterious materials from the Carmel River riparian corridor were developed by the MPWMD (see Final Guidelines for Vegetation Management and Removal of Deleterious Materials for the Carmel River Riparian Corridor, MPWMD, March 2003). These

[4] The biological opinions issued by NMFS and USFWS covered all the listed activities except CRLF enhancement projects and lowering of levees.

documents are available on the world-wide web at:

http://www.mpwmd.dst.ca.us/programs/river/erosion_potential/COE_24460S/COE_24460S.htm

1.2.2 Federally Threatened Species

Note: Since 2003, critical habitat for steelhead and CRLF has been designated. A recovery plan for CRLF is available. A draft recovery plan for steelhead was also published with a final plan tentatively scheduled to be released in late 2009.

The Carmel River is host to several sensitive species, including the Federally threatened California red-legged frog (CRLF) (*Rana aurora draytonii*) and steelhead (*Oncorhynchus mykiss*). CRLF were listed by the U.S. Fish and Wildlife Service (USFWS) as threatened under the Federal Endangered Species Act (ESA) in 1996 (61 *Federal Register* 25813, http://endangered.fws.gov/r/fr96583.html). About 45,000 acres within the Carmel Valley was designated as critical habitat in April 2006. This designation includes the channel of the Carmel River from the ocean to the Miller Canyon fork, approximately 28 miles upstream of the ocean. NOAA Fisheries listed Carmel River steelhead as threatened in 1997 (62 *Federal Register* 43937 to 43954, http://www.nwr.noaa.gov/reference/frn/1997/62FR43937.pdf). Similar to the CRLF critical habitat designation, NOAA Fisheries has designated much of the Carmel River watershed as critical habitat for steelhead, including the main stem from the ocean to the upper limit where flow begins high up in the Santa Lucia mountain range.

1.2.3 Annual Scope of Activities

Three basic types of activities are proposed: 1.) restoration projects requiring heavy construction equipment (e.g., bulldozer, loader, backhoe, excavator) to restore channel geometry and repair streambanks; and 2.) vegetation management and project maintenance carried out primarily with hand tools (e.g., chainsaw, loppers); and 3.) enhancement projects requiring some heavy equipment (e.g. a backhoe), such as for vegetation planting or spawning gravel injection.

The annual maximum scope of work proposed under this RGP would limit MPWMD-sponsored restoration projects to a total of 0.5 mile of stream length, and other sponsored projects would be limited to a total of 1,000 lineal feet (0.2 mile) of stream channel per year for a maximum of about 3,600 lineal feet (0.7 mile) of stream affected annually.

Vegetation management occurs in selected areas of the channel bottom within an identified reach and removal is often carried out in a discontinuous pattern that alternates between streambanks. No more than three miles per year of vegetation management would be carried out in any single year. Project maintenance under this permit refers to vegetation planting and maintenance of irrigation systems. Other types of project maintenance, such as bank repairs, would be considered a separate restoration project that would be included in the limit suggested above.

No limit to enhancement projects for steelhead or CRLF[5] is proposed.

1.2.4 Non-MPWMD Sponsored Projects

For projects sponsored by other parties, MPWMD will act both as an agent for the Corps and as local regulator. As a local regulator, MPWMD requires that activities within the riparian corridor comply with MPWMD ordinances and standards for the Carmel River. MPWMD will assume the responsibility for screening applicants, conducting pre-project evaluations, and inspecting project sites before, during and after construction to ensure compliance with criteria outlined in the RGP. To facilitate non-MPWMD sponsored projects, MPWMD desires a permit that is severable, which will allow MPWMD to assign portions of the permit to individual property owners. MPWMD will enter into an agreement with each party proposing to do work in order to ensure compliance with Corps 404 permit conditions and MPWMD standards. MPWMD will also issue a MPWMD River Work Permit to conduct activities. If time and staff resources permit, MPWMD will provide assistance with carrying out projects.

1.2.5 Activities Not Covered by the RGP

Activities not intended to be covered under the RGP include:

- channelization for flood control;
- installation or maintenance of levees;
- lining of the main stem with continuous rock slope protection (RSP), concrete rubble, or other permanent erosion protection, except as noted in section 1.2.8 "Proposed Activities;
- traditional grade control installation (e.g., concrete weirs, small dams).

It is presumed that project types not covered in this application could be permitted on a case-by-case basis after review.

1.2.6 Coordination with the U.S. Fish and Wildlife Service (USFWS)

MPWMD proposes to continue with the methods developed by the District for selection, prioritization, and authorization of projects. MPWMD consulted extensively with USFWS to develop appropriate avoidance and minimization measures (see Section 1.2.10 "Avoidance and Minimization Measures for Adverse Impacts to California red-legged frogs"). USFWS issued a biological opinion for RGP 24460S that included an incidental take based on the estimated potential annual mortality from activities undertaken in the river (see next section). After issuance of the biological opinion for this RGP, no additional formal consultation would be required for projects within the scope of the RGP, unless the anticipated mortality of CRLF is expected to be exceeded (see next section). Beginning in June 2004, when RGP 24460S became valid, no take of CRLF occurred as a result of activities conducted under the permit.

MPWMD will provide annual project descriptions to several regulatory agencies, including USFWS

[5] Proposed change from 2003 to allow projects that enhance CRLF habitat.

(see section 1.2.7 for details on information to be provided). USFWS will have an opportunity to review an annual list of projects and may provide direction regarding protection of CRLF.

1.2.6a Estimated Annual Mortality of California Red-Legged Frogs

There are three subsets of activities proposed for the RGP that have substantially different environments. One set is those activities focused on restoration and repair of portions of the river damaged by drought, flood, and water extraction practices. At such locations, habitat for CRLF is likely to be poor to fair and so the CRLF population is likely to be low or non-existent. These areas are characterized by lack of cover, lack of emergent vegetation, and may be subject to annual dewatering. Another set of activities is broadly termed "maintenance", such as vegetation management, revegetation, and irrigation. Areas where these activities are carried out may have higher quality habitat that would attract CRLF. A third set of activities includes enhancement of CRLF habitat. These enhancement activities could include bull frog removal, canopy modifications, vegetation planting, and stream modification (e.g., excavation of off-channel pools)[6]. Some of the areas that could be affected by these activities may contain CRLF.

In 2004, as part of the Carmel River Watershed Assessment, MPWMD gathered data on frog sightings in the Carmel River watershed between 1989 and 2003. Nearly all sightings reported since 1989 have been in the main stem[7]. However, the data appear to confirm that frog populations differ substantially between degraded areas and more stable portions of the river.

Between 1996, when CRLF were listed as a threatened species, and 2009, more than 20 repair and restoration projects were completed in the Carmel River, totaling about three miles of stream directly affected by activities in the channel bottom. No frog mortalities were recorded as a result of these permitted projects[8]. These data indicate that CRLF appear to be relatively rare in degraded areas.

In addition, during vegetation management activities between 2004 and 2009, no CRLF were found.

Based on these data and the proposed use of appropriate avoidance and minimization measures, **MPWMD estimates that the annual mortality rate for repair and restoration activities may be up to two CRLF per year.**

MPWMD records for the period between 1990 and 2009 show adult and tadpole sightings between the lagoon and San Clemente Dam (about 18 miles). With few exceptions, these were daytime

[6] This set of enhancement activities was not included in the USFWS biological opinion for RGP 24460S.
[7] See Section 5.5.2.2 in the Carmel River Watershed Assessment, which is available at http://www.mpwmd.dst.ca.us/programs/river/watershed_assessment/watershed_assessment.htm
[8] At one project (the 1997 Red Rock Project at River Mile 8), MPWMD biologists found numerous tadpoles within the project area one week before the scheduled start of construction (the day after Labor Day). Subsequently, over the September Labor Day weekend, which attracted a large influx of visitors to the Monterey Peninsula on a hot weekend, the river dried up through the project reach. When municipal demand on the Monterey Peninsula dropped after the weekend, river flow increased and the wetted front of the stream advanced through the project area. Another survey after flow returned did not turn up any live frogs or tadpoles and the project proceeded as planned.

sightings. In June 1997, MPWMD staff assisted USFWS with relocation of 56 tadpoles using an electrofisher in the main stem as the river was drying up. No mortalities were recorded. In 2002, during intense night time surveys associated with a project to install large wood in the stream, surveyors found and relocated 10 adults and two juveniles in a 2,000-foot reach near River Mile 13 at the deDampierre ballfields. No mortalities were recorded. Based on the data at deDampierre, there could be as many as 32 frogs in a one-mile reach of the river that has appropriate habitat. Maintenance and enhancement activities, including vegetation and woody debris management and fisheries enhancement, are more likely to be carried out in the areas where frogs have been sighted in the past.

Based on these data and the proposed use of appropriate avoidance and minimization measures, **MPWMD estimates that the annual mortality rate for maintenance and enhancement activities may be up to three frogs per year.**

Therefore, the total annual mortality rate for restoration and maintenance activities could potentially be up to five CRLF per year. It should be noted that no CRLF mortalities have been recorded during activities associated with the previous RGP.

If the annual threshold level of CRLF killed or injured is exceeded, then MPWMD would halt activities under the RGP and contact USFWS regarding the need for additional protective measures or reinitiation of formal consultation.

1.2.7 Coordination with the National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries)

The RGP will be implemented in a manner consistent with the process described below:

A notification package shall be prepared containing all the following information:

- maps and plans, including but not limited to a project description including date and duration of construction;
- an erosion control plan;
- a temporary streamflow diversion plan;
- description of impact minimization practices used during construction activities;
- a mitigation and monitoring plan; and,
- identification of listed species and life stages that may use the project area at any time.

MPWMD shall review the notification package for completeness and determine if the RGP is applicable to the proposed project and send the notification package to the Corps and NOAA Fisheries. MPWMD shall forward the notification package to the Corps and to NOAA Fisheries with a cover letter asking for the proposed project to be covered under the applicable Biological Opinion (Opinion) issued by NOAA Fisheries.

The Corps shall also send a notification to NOAA Fisheries and request that the proposed project be

covered under the BO issued by NOAA Fisheries for the renewed RGP.

NOAA Fisheries shall have up to 60 days to review and send comments to the Corps and MPWMD.

NOAA Fisheries shall respond within the 60 day comment period. If NOAA Fisheries does not respond within 60 days, it shall be understood that NOAA Fisheries approves the proposed package and it will be included under the Opinion.

MPWMD will be responsible for the preparation of annual post-notification/compliance reports.

These reports will contain:

- Information on all projects constructed under the RGP for a given year;
- MPWMD evaluation forms prepared for each project; and
- Project specific information such as: a) project descriptions, b) project impacts, c) maps, d) pre- and post construction photographs, e) quantities and types of fill material placed and/or acreage of Federal jurisdictional areas affected, f) salmonid life stages that may use the project area at any time, and g) compliance with all permit conditions.

In summary, MPWMD will send complete notification packages to the Corps and NOAA Fisheries for projects that fall under the Opinion. MPWMD, in cooperation with the Corps, will request concurrence from NOAA Fisheries that the actions are covered by the Opinion and NOAA Fisheries shall respond within 60days. If NOAA Fisheries concurs, the action will be appended or tiered to the consultation and an Incidental Take Statement (ITS) will be prepared, if necessary. In addition to following the above procedures, only actions consistent with the minimization measures analyzed in the effects section of the Opinion shall be covered under this programmatic Biological Opinion.

It should be noted that no steelhead mortalities were recorded as a result of activities carried out between 2004 and 2009 under RGP 24460S.

1.2.8 Proposed Activities

1.2.8.a Installing Erosion Protection

1. Excavation and Backfill

Grading of the river banks may be required to recontour or reduce the slope of the existing bank to 2:1 or flatter[9]. In cases where the river bank is being severely undercut or eroded, the toe of the bank may be stabilized by excavation of a toe trench, up to several feet deep, below the adjacent channel bottom and backfilling the trench with rip-rap and/or incorporating a biotechnical method to prevent scour. Material excavated from such trenches would normally be placed on the

[9] The 2003 document allowed 1.5:1 slopes. It is clear that 2:1 slopes (or flatter) are less likely to fail and that 1.5:1 slopes (especially on the outside of meander bends) are subject to failure.

streambanks.

Temporary fill for access may be required to allow equipment into the work area. Excavation and fill may be necessary for a temporary flow diversion structure, if necessary. Excavation activities could include the use of a backhoe to dig planting holes for trees and to trench irrigation lines. Prior to the start of channel grading work, salvageable vegetation along the project reach may be removed with mechanized equipment and relocated within the project. In areas where the banks have been severely eroded, excess channel or gravel bar material may be excavated, stockpiled and used as backfill material. Only material above the level of frequent flows (i.e., the 1.5- to 3.0-year return flow) will be excavated. Fill material required for bank stabilization projects may include rock slope protection, vegetative material and other material such as boulders and logs. Fill material could also include topsoil that would be placed over rip-rap and along graded banks.

2. Importation of Fill Material

Areas with property loss could be backfilled to a pre-loss configuration. Imported soil shall be free of deleterious material and be coarse grained (i.e., have some gravel in it), sandy loam, loamy sand, or sand. Fill material should match, as nearly as possible, the grain size distribution found within the project area. As with excavation and backfill activities, streambank areas could be stabilized with structural and/or biotechnical erosion protection in key areas.

3. Slope Protection

Slope protection may be installed along unstable, degraded areas of banks which have eroded and are causing sediment input into the river or are threatening structures along the riverbank. It should be noted that all bank stabilization projects conducted under this permit shall incorporate bioengineering techniques as the first choice of construction methods.

Where bank erosion occurs within 25 feet of public or private infrastructure (including, but not limited to roads, buildings, bridges, and utilities), the use of rip-rap, gabion baskets or other traditional slope protection may be used. Slope areas adjacent to structures may also be graded at a 1.5:1 slope, if a 2:1 slope is not possible (e.g., due to floodplain regulations that restrict the amount of fill that can be placed within the 100-year floodway). Gabion baskets will be restricted to slope areas higher than eight feet above the channel bottom. Where structures are not within 25 feet of an erosion site, no more than eight vertical feet of rip-rap will be used above the channel bottom.

Note: The active channel refers to the lowest portion of the main stem channel that is occupied by flows of between the 1.5-year and 3.0-year return frequency. Generally, for the Carmel River, this is the area within the bottom of the channel that is inundated by four to eight feet (vertically) of flow. This approximates the Corps of Engineers wetlands jurisdictional limit.

The majority of these sites are located on the outside of meander bends, or in areas where bank vegetation has eroded away. Slopes protected by structural erosion protection will be built at a 2:1 (horizontal to vertical) grade or flatter.

Erosion protection installed on these slopes could include biodegradeable erosion control fabric[10], live plant material, logs, rootwads, or other flexible types of erosion protection. At the outside of bends and in critical erosion areas, a combination of erosion resistant materials, log deflectors, rip-rap and vegetation will be installed to provide bank protection in case of high flows. Erosion protection installed along the outside of meander bends may consist of granite rip-rap in the 1/4-to 3-ton class, if it is infeasible to install bioengineered structures. This structural protection will eventually blend into vegetation planted on the bank and along the toe of the riverbank.

Filter fabrics that act as a barrier to root development would not be allowed; other filtering materials such as biodegradable filters, gravel filters or "backing rock" would be used. One exception would be for slope protection of public or private infrastructure that is within 25 feet of the active channel.

4. Temporary Diversion Channel

Where necessary, in order to divert flow around a work site in areas of perennial flow, a trench will be excavated, usually in a dry portion of the channel bottom, to pass flow around the site. Material excavated from the trench (primarily sand, gravel, and cobble) will be used to temporarily block the bottom of the channel and divert flow into the excavated trench for the duration of the project. After construction is completed, the diversion berm is removed and the excavated trench area filled in to pre-existing contours.

Prior to diverting flow around a work site, steelhead would be rescued and removed from the site. Porous fish fences and/or rock barriers would be set up to prevent migration into a repair site. Fish fences (plastic mesh) are less desirable than rock barriers, as they require daily cleaning due to algae and other organic build-up and are subject to failure if flow fluctuates. Fish are electro-shocked, placed in an insulated, oxygenated tank filled with Carmel River water, and transported to areas of perennial flow or to the MPWMD Sleepy Hollow Steelhead Rearing Facility. Water temperature in the tank is controlled by using ice if necessary. Generally, fish are not placed downstream of a repair site, as habitat conditions usually decrease in the downstream direction due to reduced flow and increased water temperature. However, if conditions allow, fish could be placed downstream of a repair site.

If flow in the river is perennial or nearly so throughout the river, fish located in repair sites can be captured with a variety of techniques, designed to minimize capture stress, direct mortality from acute physical injury, and delayed mortality from mild injuries. Once the porous rock barriers are set up at the head and tail of the repair site, flow should be gradually reduced through the site to maintain viable habitat conditions and improve efficiency of capture gear, which can include 1/4" stretch mesh beach seines and electrofishing gear. Electrofishing techniques will follow guidelines

[10] The 2003 document allowed geotextiles, which are frequently made of synthetic materials, such as polypropylene. Rip-rap installations using synthetic fabrics to prevent piping and collapse of the non-cohesive soils in the streambanks along the river have shown no better stability than rip-rap installations without synthetic filter fabric. In some areas, filter fabric appears to suppress vegetation and becomes a slip-plane for rocks to slide down slopes during high flows. Suitable substitutes (if necessary) for filter fabrics include granular filters made from gravel and small rock.

as established by the NOAA Fisheries. The minimum amount of current and voltage will be used to ensure capture of 95% of the fish during three repetitive passes through the repair site over a one-day period, and in no case should output voltage exceed 300 volts. The data on cumulative catch and catch per unit will be used to estimate total population size in the repair site. Additional passes may be needed to ensure that 95% of the fish are captured before the repair site is dewatered and all surface flow is shifted to the diversion.

1.2.8.b Channel Restoration

1. Excavation and Backfill

Excavation and fill activities may be required to implement channel restoration projects. Excavation of sand and gravel bars may be carried out to realign the active channel into a more stable configuration. This is a key component of reestablishing meander geometry and recreating low-lying floodplain areas. A low-flow channel capable of carrying dominant or frequent flows (1.5- to 3.0-year events) is excavated within the channel bottom. This low-flow channel meanders back and forth within the main stem and generally has a wavelength of between 1,000 and 2,000 lineal feet. The amplitude of meanders is frequently dictated by existing constraints; however, where possible, an increase in amplitude (i.e., sinuosity) would be desirable. For large restoration projects, this activity is frequently combined with installation of erosion protection at critical areas, such as at the outside of meander bends.

In most cases, large equipment such as a front end loader, dump truck, backhoe, bulldozer or excavator will be used to restore channel geometry to a more stable alignment. Temporary fill for access may be required to allow equipment into the work area. Excavation and fill may be necessary for a temporary flow diversion structure. Prior to the start of channel grading work, salvageable vegetation within the project reach may be removed with mechanized equipment and relocated to bank stabilization project areas.

Projects normally include excavation of a narrow stable channel, excavation of a pool and riffle sequence after reestablishment of a stream channel, excavation of gravel bar material, and replacement of cobble and gravel material along the channel bottom. During excavation, substrate material is stockpiled at the beginning of grading and replaced during final grading operations.

1.2.8.c Channel Realignment

Project work starts by surveying and staking out project boundaries to prevent heavy equipment operation outside the work area. The contractor begins grading by scraping off the "upper" layer of the riverbed, which contains the largest proportion of cobbles and gravel. This material is stockpiled for later use as a finishing layer to promote steelhead spawning and to form a restraint to bed mobilization. Deleterious material, such as auto parts, various metal objects, and refuse will be hauled away to an appropriate dump site outside Corps jurisdiction. A channel of appropriate dimensions will be graded in the stream bottom. The finished channel will be designed to carry excess sediment stored in point bars located within and upstream of the project.

Material excavated from the channel can be used to buttress eroded slopes and to build an active floodplain for vegetation plantings. After completion of this work, a smaller pilot channel is excavated within the main channel. This pilot channel provides fish passage for migrating steelhead during periods of low flow. Pools are excavated at appropriate intervals (usually five to seven channel widths) to provide areas for migrating steelhead to rest and feed and to provide habitat for California red-legged frogs. In most areas the finished stream bottom will be at or near the elevation of the existing channel bottom.

If existing streamside ponds or pools are filled in during channel and floodplain construction, this action would be offset by the creation of new pools and/or low-lying floodplain areas adjacent to the low flow channel.

1.2.8.d Reestablishing Riparian Vegetation

Banks and low floodplain terraces will be revegetated with willow, cottonwood, sycamore, box elder, elderberry, and other native riparian species. Special emphasis will be placed on revegetation with plant species which are appropriate for the restored bank or terrace elevation and moisture condition. The integration of top soil into the slope assists in the retention of moisture, and provides a more nutrient-rich medium for root development. In several of the MPWMD-sponsored restoration areas, the willows are sufficiently large that cuttings for other projects can be taken.

All graded slopes, including rip-rapped areas, will be revegetated with cuttings or seedlings on a four- to seven-foot grid. As a component of reestablishing native riparian cover, an irrigation system will be installed (if needed), operated, and maintained for a minimum of three years. If feasible, appropriate low-lying areas may be irrigated to provide refugia for wildlife. Weed removal would continue for a minimum of three years. MPWMD standards for the Carmel River include replanting of native riparian vegetation in areas that do not achieve a 70% success rate by year three after initial planting.

1.2.8.e Fisheries Habitat Enhancement

Improvement of degraded anadromous fisheries resources in the lower Carmel River watershed has long been considered a primary goal of MPWMD's river restoration program. Several activities are proposed by MPWMD to enhance or restore steelhead habitat. Fish habitat enhancement projects include excavation of a pool and riffle sequence after reestablishment of a stream channel, placement of log and boulder groups at erosion protection locations to provide additional habitat, replacement of gravel material along the channel bottom, flood plain restoration, and revegetation of riparian habitat along the banks of the river. These actions will reduce the potential for bank erosion that degrades aquatic habitat and will increase the availability and quantity of rearing and spawning habitat.

The live plant material, logs, and rootwads incorporated with slope protection, including boulders, will enhance steelhead habitat. This material will provide shelter and cover for juveniles as well as

substrate for macroinvertebrates.

Spawning gravels may be injected at various locations between Carmel Valley Village and the upstream limit of the RGP. These gravels will be delivered to the channel by dump trucks unloading gravel along the streambank and allowing high flows to distribute the gravels downstream. At restoration sites, contractors will be required to skim the top four- to twelve-inch layer of gravel and stockpile it, replacing it back onto the channel bed once the restoration work is completed. This results in the reestablishment of substrate suitable for spawning and macroinvertebrates.

Revegetation and irrigation will occur at streambank restoration sites as well as in areas impacted by water extraction. These efforts will occur throughout the riparian corridor along streambanks, in floodplain areas and occasionally in terrace areas. Plantings will include many of the woody riparian species found in the Carmel River drainage and several understory species.

1.2.8.f Vegetation and Woody Debris Management

Since Fall 1990, MPWMD has carried out annual channel maintenance projects along portions of the Carmel River to reduce the potential for bank erosion and to maintain channel capacity. Vegetation growth and sediment deposits trapped by vegetation can decrease hydraulic capacity of the river channel and increase the potential for bank erosion and damage to public infrastructure. MPWMD targets only woody plant material representing an erosion threat to streambanks and public infrastructure. In addition to erosion hazard reduction for property, channel maintenance objectives include removing trash and inorganic debris from the river channel, and maintaining aquatic habitat.

Under this RGP, MPWMD proposes to modify or remove vegetation and wood from the channel bottom under a limited set of circumstances and with full recognition of and mitigation for impacts associated with such activity. These activities would follow MPWMD's Final Guidelines for Vegetation Management and Removal of Deleterious Materials for the Carmel River Riparian Corridor, March 2003[11]. Streamside plants growing on adjacent riverbanks would not be affected. Vegetation cutting normally will be done by hand crews using hand tools and hand-held power tools. Some cut vegetation will be chipped on the terraces above the riverbank or utilized in MPWMD bank stabilization projects elsewhere along the river. Large wood (defined here as four inches or greater in diameter or three feet or longer in length) may be modified under certain circumstances, but would be left in the channel.

1.2.8.g Maintenance of Previously Authorized Projects

One of the goals of MPWMD's management of the Carmel River is to carry out works that will eventually need no maintenance; however, floodplain development, two existing main stem dams, and water extraction practices disrupt restorative processes that would normally occur in the riparian zone. Projects to restore or enhance streamside habitat and the species that depend on this habitat

11 These can be downloaded at:
http://www.mpwmd.dst.ca.us/programs/river/watershed_assessment/5_5/5_5_1/5_5_1_5/appendix%205.5.1.5-B.pdf

may require maintenance work either to repair flood damage, stabilize a project after initial construction, or maintain the effectiveness of a project.

Maintenance work of stream restoration projects normally includes irrigation operation and repair, weed removal, and installation of supplemental plantings. For MPWMD-sponsored projects, MPWMD normally enters into a 10-year agreement with landowners to perform this type of activity. For privately sponsored projects, MPWMD requires maintenance for a three-year period, which is a generally accepted period for plant establishment.

Restoration projects using techniques that rely on streamside vegetation for erosion protection are vulnerable to damage from high flows in the first few years after plant installation. For this reason, repairs may be required to stabilize damaged areas. A combination of methods and techniques previously discussed would normally be used in repair work.

In addition to vegetation management and streambank stabilization and restoration activities, past projects authorized by the Corps have included injection of steelhead spawning gravels and installation of water diversion facilities to supply the Sleepy Hollow Steelhead Rearing Facility (SHSRF). Currently, MPWMD is applying for grants to inject additional spawning gravels in the near future in order to replenish areas where they have been washed away as it is recognized that a lack of spawning habitat is a limiting factor for steelhead in the Carmel River. In addition, MPWMD is studying options to improve the reliability at the SHSRF. If funding and staff resources become available, these activities may be carried out.

1.2.8.h Installation of Engineered Large Wood Structures[12]

Most river managers presume that large wood and debris reduce channel conveyance and act as a potential threat to bank stability. However, since about the mid-1990's, there has been increased interest in the use of engineered large wood structures to create stream complexity and enhance aquatic habitat. In the Carmel River, there are several examples of where large wood has been incorporated into restoration design.

Engineered large wood could be used to stabilize streambanks, enhance aquatic habitat, and could be used in areas where the channel is degraded (incised into the floodplain) to help slow degradation. Because the main channel has limited conveyance capacity and there are strict regulations governing the placement of material that could raise flood elevations, engineered wood structures may have limited use. But in some reaches, these may be an appropriate or a desirable alternative to more traditional structural approaches to bank restoration. Most of the avoidance and minimization measures that apply to channel restoration and channel realignment would also apply to installation of large wood in the stream.

1.2.9 Avoidance and Minimization Measures for Adverse Impacts to Steelhead

[12] New proposed activity.

The following descriptions of minimizing typical impacts from construction activities are presented to provide assistance to MPWMD and the applicants. The level of potential impacts and the correlated level of impact minimization measures needed for all projects are difficult to determine at this time. The descriptions of impact minimization measures are general guidelines with which proposed projects will be consistent as a requirement for being appended to a Biological Opinion. Nevertheless, site specific characteristics should dictate impact minimization practices deployed as the impact minimization practices described below are generalized and may not prevent adverse effects at specific projects.

Projects will be evaluated by NOAA Fisheries to determine if the impact minimization measures are sufficient to avoid or minimize adverse effects.

1.2.9.a Harassment from In-Water Construction or Activities

Generally, impacts from construction activities may be sufficiently minimized if they are conducted in the following manner:

1. The work window for construction projects shall be between July 1 and October 31 of each year.

2. Construction is in the dry stream channel by being separated from flowing water, or if the channel is dry seasonally by being conducted during the dry period.

3. Listed steelhead in the project area during construction activities are removed prior to the onset of activities.

1.2.9.b Dewatering or Water Diversions

Dewatering will result in an incremental temporary loss of steelhead habitat during the construction period. The following descriptions of typical impact minimization measures for dewatering are presented to provide assistance to the MPWMD and applicants. Generally, if project activities are conducted according to the principles below, impacts may be sufficiently minimized.

4. No redds are dewatered when eggs or alevins are present.

5. The stream channel is returned to its original state at the completion of dewatering and construction.

6. The duration of dewatering is minimal.

7. The dewatering method minimizes harassment, risk of mortality, risk of entrapment, and risk of stranding of steelhead.

8. Projects that require dewatering of the stream channel shall first avoid dewatering the entire

channel in order to maintain passage for steelhead by methods such as the following examples: use of a washed, clean gravel berm slowly placed to displace steelhead without crushing any; inflatable bladders from behind which fish are chased away.

9. Projects requiring entire stream dewatering shall incorporate the installation of a coffer dam and temporary bypass channel, or other methods which minimize impacts to steelhead.

10. Channel and bank disturbances are first avoided, then minimized, during placement of the dewatering structure.

11. Any wastewater from project activities and de-watering is disposed of off-site or in a location that will not drain directly into a stream channel or carry sediment-laden water into a stream channel.

12. The following measures will be taken to monitor and report the incidental take of listed steelhead:

13. For projects involving dewatering, project proponents will use fisheries biologists familiar with identification and handling of all life stages of listed steelhead to monitor the specific project area.

14. Prior to and during stream flow diversion and dewatering the biologist shall capture any steelhead that may become stranded in the residual wetted areas as a result of project activities, and relocate the individuals to the nearest suitable instream location immediately up- or downstream of the work area. All fish shall be moved promptly and transported in insulated containers filled with cool, well-oxygenated water. Fish will be captured, held and transported according to MPWMD's guidelines titled Recommended Number of Juvenile Steelhead in 5-, 125-, and 400-Gallon Containers, at Loading Densities Ranging from 0.01 to 0.1 Kg/Kg (see **Table 3**).

15. The fishery biologist shall note the number of individuals observed in the affected area, the number of individuals relocated, and the date and time of the collection and relocation. All efforts shall be taken to neither exhaust nor kill listed steelhead during collection and relocation.

16. The fishery biologist shall be empowered to halt work activity during steelhead collection.

17. After construction, when water is returned to the construction area, the habitat will be accessible to steelhead.

1.2.9.c Construction Access and Temporary Stream Crossings

Potential impacts from construction activities can be avoided or minimized by following all appropriate minimization measures described in the Biological Opinion. Additionally, the following practices are necessary to minimize impacts:

18. The work window for construction projects is between July 1 and October 31 of each year.

19. Construction impacts are confined to the absolute minimum area necessary to complete the project, and the site rehabilitated prior to October 31 each year.

20. Damaged areas are restored to pre-work conditions. Where the site shall be revegetated or restored, top soil is stockpiled for re-distribution on the project area.

21. Temporary crossings shall pass all listed steelhead in the stream concurrent with the crossing
.
22. Temporary crossings are removed prior to October 31 each year.

23. Flatcar bridges with preconstructed footings are used if they create less impacts than temporary culverts.

1.2.9.d Impediment to Upstream or Downstream Migration by Listed Steelhead During Water Diversion/Bypass Construction Activities

Generally, impacts from construction activities may be sufficiently minimized if they are conducted in the following manner:

24. Temporary migration impediments occur only during non-migratory periods.

25. The amount of time a temporary migration impediment is in place shall be restricted to the minimum necessary to complete the project.

26. If a bypass pipe is installed, depending on the site and potential impacts to listed steelhead from being in the bypass pipe, either screen the pipe, adhering to NOAA Fisheries screening criteria (NOAA Fisheries 1996; NMFS 1997), to prevent fish from entering, or use pipe that facilitates migration, for example, a pipe containing baffles and that is kept out of direct sunlight to prevent warming.

1.2.9.e Degradation of Water Quality and Channel Structure from Turbidity or Sediment Plumes, Petroleum Products from Machinery, Leachate from Material Used in the Water, and Fertilizers and/or Herbicides Used During Revegetation

Construction can produce significant sedimentation. The following descriptions are measures to minimize sediment delivery to streams from construction activities. The objective of effective sediment minimization practices is to reduce amounts of fine sediments delivered from a project to a stream to a level that is immeasurable and discountable in effects. If construction activities were conducted consistent with the following measures, sediment delivery may be minimized:

27. Construction occurs between July 1 and October 31.

28. Construction is avoided when eggs or alevin are in the gravels downstream.

29. Excavation in streambanks is isolated so that water is prevented from entering the excavated area until the project materials are installed and erosion protection is in place.

30. Effective erosion control measures are in-place at all times during construction. Construction within the 5-year floodplain begins with placement of all temporary erosion controls (e.g., straw bales, silt fences that are effectively keyed in) downslope of project activities within the riparian area. Erosion control structures are maintained throughout and possibly after construction activities.

31. Sediment is removed from sediment controls once it has reached one-third of the exposed height of the control. Whenever straw bales are used, they shall be staked and dug into the ground 12 cm. Catch basins are maintained so that no more than 15 cm of sediment depth accumulates within traps or sumps.

32. Sediment-laden water created by construction activity is filtered before it enters the stream network or an aquatic resource area.

33. A supply of erosion control materials (e.g., straw bales and clean straw mulch) is kept on hand to respond to unanticipated storm events or emergencies.

34. The use of end hauling is maximized to reduce the temporary stockpiling of earth to be removed from the project site.

35. Temporary stockpiling of earth during wet weather is avoided.

36. Concurrent with projects occurring during wet weather, erosion control (protection or stabilization) is used on stockpiles (all of which shall be temporary and unavoidable) and exposed soils. Soils will not be left exposed overnight; exposed soils will receive final erosion protection as soon as that area will not receive further disturbance, and all areas will be stabilized within 7 days of project completion or prior to forecasted rain, whichever is sooner. Movement of soil off of stock piles will be prevented by, for example, covering any temporary stockpiles with plastic sheeting or tarps; and/or installing a berm around the stockpile; and/or preventing the overland flow of water from upslope road or hillside from contacting stockpile; and by preventing any water-carrying material from a stockpile from entering the aquatic ecosystem.

37. Material removed during excavation is placed only in locations where it cannot enter stream networks. Conservation of topsoil (removal, storage and reuse) is employed.

38. Sediment wedges that may be released by a proposed project are removed to an upland location, placed in a location where they cannot enter stream networks or road drainages that

are hydrologically connected to a stream and stabilized.

39. After project completion and prior to October 31, all exposed soil is stabilized, e.g. erosion control seeding and mulching. Placement of erosion control blankets and mats (if applicable) will occur within 7 days.

40. Efforts are made to cover exposed areas as soon as possible after exposure.

41. Temporary fill is removed in its entirety prior to October 31 of the year of activities.

42. Areas for fuel storage, and refueling and servicing of construction equipment and vehicles, are located in an upland location.

43. All equipment that is used for in-water work is cleaned to remove external oil, grease, dirt and mud prior to placing the equipment in the water; wash sites are placed so that wash water does not flow into flowing waters or wetlands; equipment is in good condition showing no signs of leaking fuels or fluids.

44. Petroleum products, chemicals, fresh cement, or deleterious materials are not allowed to enter flowing waters.

45. Water contaminated by petroleum products, chemicals, fresh cement, or deleterious materials is not allowed to enter flowing waters.

46. In the event of a spill, the permittee stops work immediately, begins clean up and notifies the appropriate authorities.

47. Spill clean-up supplies, for example, absorbent booms (when working in live streams), are on site and operators know how to employ them.

1.2.9.f Loss of LWD and In-Channel Vegetation from Vegetation Management Activities

The following are descriptions of typical impact minimization measures and mitigation for in-channel vegetation and LWD removal. Generally, if project activities are conducted in the manner below, impacts may be sufficiently minimized.

48. The amount of in-channel vegetation removal is minimized to only what is necessary to reduce erosion and potential bank failure.

49. Only in-channel vegetation larger than 3" in diameter is removed.

50. Vegetation clearing is done with the use of hand tools and hand-held power tools.

51. Only LWD that poses a hazard to public facilities (i.e., bridges) is notched and left in the

channel to break apart if mobilized; otherwise, all LWD is left undisturbed in the channel.

52. Heavy equipment, used to remove saplings and rootwads for salvage and replanting, operates only in the dry channel bed

53. Compaction is minimized by using equipment that either has (relative to other equipment available) less pressure per square inch on the ground or a greater reach, thus resulting in less compaction or less area overall compacted or disturbed.

1.2.9.g Loss of Riparian Vegetation

The following descriptions are typical impact minimization measures and mitigation for riparian vegetation loss. Generally, if project activities are conducted in the manner below, impacts may be sufficiently minimized.

54. All native trees and brush are retained as feasible, emphasizing the shade-producing and bank-stabilizing trees and brush.

55. Project designs and access points are used that minimize riparian disturbance without affecting less stable areas which may increase the risk of channel instability.

56. Compaction is minimized by using equipment that either has (relative to other equipment available) less pressure per square inch on the ground or a greater reach, thus resulting in less compaction or less area overall compacted or disturbed.

57. At the completion of the project, soil compacted areas are decompacted.

58. Disturbed and decompacted areas are revegetated with native plant species. The species used shall be specific to the project vicinity, and comprise a diverse community structure (plantings should include both woody and herbaceous species).

59. A ratio of 3 plantings to 1 removed plant (3:1 ratio) is used.

60. Unless otherwise specified, the standard for success is 70% survival of plantings after a period of three years.

61. Broadcast planting of seed results in 70% ground cover after a period of three years.

62. Mitigation and restoration sites are monitored yearly in spring or fall months for three years. If there is not 70% survival after three years, all plants that have died are replaced during the next planting cycle (generally the fall or early spring) and monitored for a period of three years after planting.

63. If chemical fertilizers are applied, fertilizer does not enter the hydrologic network or is

carried by runoff into the hydrologic network.

64. Herbicides are not applied in the project area, except at MPWMD irrigation sites only to control poison oak and non-native invasive species. Only the use of Rodeo or a technical grade of glyphosphate (without surfactant) will be allowed.

1.2.9.h Bank Hardening and Associated Habitat Loss and Long Term Channel Changes (Bank Stabilization, Rock Slope Protection, Gabion Baskets)

The following descriptions are typical impact minimization measures and mitigation for habitat loss associated with bank hardening practices. Generally, if project activities are conducted in the manner below, impacts may be sufficiently minimized.

65. The first choice of bank stabilization techniques shall be soft bioengineering methods. Rock slope protection (RSP) is used only as a last choice when bioengineering methods cannot provide adequate protection to infrastructures.

66. Very large angular rock is used to reduce chance of movement.

67. LWD is incorporated into the RSP.

68. Willow cuttings are staked through the RSP into the bank beneath.

69. RSP is terraced and trees are planted on the terraces.

70. Soil is embedded into the interstitial spaces above ordinary high water (OHW) and planted with riparian vegetation.

71. RSP is designed with hard points. Instead of a solid linear wall of RSP along a length of streambank, rock groins are placed strategically in noncontiguous sections.

72. An underlay of gravel, biodegradable filter fabric or matting is sometimes appropriate for RSP.
73. Gabion baskets are used only on slopes eight feet above the toe of the channel in limited, steep areas where alternative bank stabilization techniques would fail.

1.2.10 Avoidance and Minimization Measures for Adverse Impacts to California red-legged frogs

MPWMD recommends adopting the following minimization and mitigation measures, which are based primarily on modified terms and conditions provided by biological opinions previously issued to the Corps for projects along the Carmel River (1-8-96-F-42; 1-8-F-98-65) and subsequently

revised by the MPWMD through coordination with the U.S. Fish and Wildlife Service (USFWS). Projects must be substantially in conformance with the goals, descriptions, and standards as described in this Project Description.

74. Prior to or during submission of projects proposed to be implemented within the following year, the MPWMD would submit to USFWS the qualifications of the biologist(s) who will conduct the activities as identified in the minimization and mitigation measures below. USFWS shall approve the biologist(s), and shall approve any personnel who may be hired in the future to conduct activities associated with California red-legged frog mitigation. Only approved biologists shall be authorized to handle California red-legged frogs. Prior to handling any California red-legged frogs, these individuals shall be trained to handle the species by a qualified herpetologist familiar with ranids, if necessary.

    For each proposed project, the MPWMD would conduct, or cause a project sponsor to carry out, an assessment of California red-legged frog habitat within the proposed work area according to habitat assessment forms developed by the MPWMD. This assessment includes documentation of incidental observations of California red-legged frogs. The results of the habitat assessment would be submitted to USFWS along with other project-related information. For activities within a designated critical habitat reach, the MPWMD shall include a review of the primary constituent elements of critical habitat for the California red-legged frog. The habitat assessment shall extend a minimum of one pool and riffle sequence up and downstream of the work area (i.e., through the end of the closest pools up and downstream of the project site). The MPWMD would also provide an assessment of potential impacts to habitat from proposed activities. The MPWMD or USFWS-approved biologists would conduct habitat assessments. The proposed field habitat assessment forms are included as **Table 4.**

75. For all project-related construction activities that occur within the channel and the floodplain, a USFWS-approved biologist shall survey the work area twice at night and twice in daylight hours using USFWS's protocol for field surveys of California red-legged frogs dated February 18, 1997, within one week before the onset of activities. Should the survey protocol be revised by USFWS, the MPWMD shall use the updated protocol, as recommended by USFWS. The survey shall extend a minimum of one pool-riffle sequence up and downstream of the work area. If California red-legged frogs are found, the approved biologist shall contact USFWS to determine if moving of adults is appropriate. In making this determination USFWS shall consider if an appropriate relocation site exists. If USFWS approves moving animals, the approved biologist shall be allowed sufficient time to move California red-legged frogs from the work site before work activities begin. Only USFWS-approved biologists shall participate in activities associated with the capture, handling, and monitoring of California red-legged frogs. If feasible, MPWMD shall tag relocated animals. Tagging methods shall not include permanent removal of any parts or disfigurement of any parts of the body.

76. Project activities shall be completed primarily between July 1 and October 31, with exceptions noted in measure 73 below, which begins with "Activities that may be completed

outside of the proposed July 1 and October 31 work period…". For activities proposed to be conducted between July 1 and October 31, the following measures will be taken.

77. If any California red-frogs are observed during pre-construction surveys within a particular work site, relocation is determined to be inappropriate and/or if tadpoles are observed, the area shall be inspected by a USFWS-approved biologist for California red-legged frogs daily prior to the onset of activities. If any California red-legged frogs are detected during daily inspections, the approved biologist shall delay work activities until they move or are removed from the immediate work site.

78. If relocation of California red-legged frogs is determined to be appropriate prior to the onset of construction, a USFWS-approved biologist shall be present at the work site until such time as all removal of California red-legged frogs, instruction of workers, and habitat disturbance have been completed. After this time, the contractor or permittee shall designate a person to monitor on-site compliance with all minimization measures. The USFWS-approved biologist shall ensure that this individual receives training in carrying out monitoring and identification of California red-legged frogs as described in measure 72.a. The monitor and USFWS-approved biologist shall have the authority to halt any action that might result in impacts that exceed the levels anticipated by the Corps and USFWS during review of the proposed action. If work is stopped, the Corps and USFWS shall be notified immediately by the USFWS-approved biologist or on-site biological monitor.

79. Activities that may be completed outside of the proposed July 1 and October 31 work period consist of those described below.

80. Revegetation of graded areas with construction equipment shall be completed within a year following project implementation, provided the following measures are taken: work shall not occur within or adjacent to the flowing stream or in standing water; no existing native vegetation will be removed or disturbed; a USFWS-approved biologist shall inspect the restoration site for the presence of California red-legged frogs prior to the onset of revegetation activities, and; if any California red-legged frogs are detected, the approved biologist shall stop work activities until they move out of the work site or are relocated.

81. During revegetation activities with construction equipment, additional inspections of a work site for the presence of California red-legged frogs by a USFWS-approved biologist may be required if weather conditions change in a manner that may cause individuals to move into or through the site (i.e., during rainy conditions). USFWS shall be contacted prior to the onset of such activities to determine whether additional inspections (e.g., on a daily basis) by a USFWS-approved biologist should be required.

82. No work will occur within 25 feet of any area known to be occupied by California red-legged frogs or known to provide breeding habitat, unless otherwise approved by USFWS.

83. Revegetation by hand methods may be conducted at any time by MPWMD biologists and/or restoration maintenance staff.

84. Monitoring, including such activities as surveys for topography, water and sediment movement, wildlife, and vegetation may be conducted at any time. Such surveys shall use passive methods.

85. Should the proponent or applicant demonstrate a need to conduct activities beyond the July 1 to October 31 work period, in addition to those specified in the previous measure, such activities may be authorized after obtaining USFWS's approval.

86. Prior to implementation of any construction activities, a MPWMD or USFWS-approved biologist shall conduct a training session for all construction personnel. At a minimum, the training shall include a description of the California red-legged frog and its habitat, the importance of the California red-legged frog and its habitat, the general measures that are being implemented to conserve the California red-legged frog as they relate to the project, and the boundaries within which the project may be accomplished. Brochures, books and briefings may be used in the training session, provided that a qualified person is on hand to answer any questions.

87. During project activities, all trash that may attract predators shall be properly contained, removed from the work site and disposed of regularly. Following construction, all trash and construction debris shall be removed from work areas.

88. All fueling and maintenance of vehicles and other equipment and staging areas shall occur at least 20 meters from any riparian habitat or water body. The permittee shall ensure contamination of habitat does not occur during such operations. Prior to the onset of work, the permittee must prepare a plan to allow a prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

89. Prior to beginning construction activities, final design plans shall be reviewed by the MPWMD. Final design plans shall incorporate restoration of natural channel morphologic features including, but not limited to shallow floodplains, backwater areas, off-channel ponds, pool-riffle sequences, and meanders, to the extent possible. Structural protection, such as rip-rap or similar hard streambank lining, shall be minimized and shall include features to enhance aquatic habitat, such as rootwads and live vegetation.

90. To the maximum extent possible, existing vegetation shall be preserved during construction activities. Existing vegetation in areas that receive fill material for stream bank repair or stabilization shall not be removed except for trimming to provide equipment access to place fill material. No trees shall be removed from these areas for access or during grading or placement of rip-rap. Vegetation trimmings shall either be stockpiled for use in revegetation or shall be disposed of off-site. In areas where soil is removed, vegetation shall be salvaged and shall be placed in areas that receive fill material as near to the surface of the fill as possible.

91. A planting and monitoring plan shall be included with the final project design for review and approval by the MPWMD. Such a plan would include the location of the proposed restoration, species to be used, restoration techniques, time of year the work would be done, identifiable success criteria for completion, and remedial actions if the success criteria are not achieved. Project sites shall be revegetated with an appropriate assemblage of native riparian and upland vegetation suitable for the area. Plants shall be selected from a species list maintained by the MPWMD. The details of a monitoring program will depend on the nature and extent of habitat disturbance.

92. An MPWMD or USFWS-approved biologist shall ensure that the spread or introduction of invasive exotic plant species shall be avoided to the maximum extent possible. When practicable, invasive exotic plants in the work areas shall be removed.

93. The number of access routes, number and size of staging areas, and the total area of the activity shall be limited to the minimum necessary to achieve the project goal. Routes and boundaries shall be clearly demarcated, and these areas shall be outside of riparian and wetland areas. Where impacts occur in these staging areas and access routes, restoration shall occur as identified in measures 78 and 79.

94. To control erosion during and after project implementation, the applicant shall implement best management practices, as identified by the appropriate Regional Water Quality Control Board or the Monterey County Planning and Building Inspection Department.

95. If a work site is to be temporarily dewatered by pumping, intakes shall be completely screened with wire mesh not larger than five millimeters to minimize the risk of California red-legged frogs entering the pump system. Water shall be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Upon completion of construction activities, any barriers to flow shall be removed in a manner that would allow flow to resume with the least disturbance to the substrate.

96. An MPWMD or USFWS-approved biologist shall permanently remove, from within the project area, any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible. The permittee shall have the responsibility to ensure that their activities are in compliance with all local, State, and Federal laws, ordinances, and statutes.

1.2.11 Reinitiation of Formal Consultation

Activities proposed for this RGP address a certain range of the dynamic behavior of the river; however, analysis of the effects of these activities on threatened species is based primarily on past experience and present river conditions. Reinitiation of formal consultation may be required if changes to the river and threatened species occur that are not considered for this RGP.

Rivers are the most actively changing of all geomorphic forms and the Carmel River is no exception.

Rather, the Carmel River may be one of the more dynamic rivers for its size, as the Mediterranean climate has a wide range of extremes. Adding to this basic dynamic is the near-term potential for two significant environmental changes due to structural changes in the water supply system for the Monterey Peninsula, which are discussed below. Either change could result in both positive and negative changes to habitat and Federally threatened species and may lead to a reinitiation of formal consultation.

San Clemente Dam Retrofit Project

The San Clemente Dam, which was completed in 1921, does not meet current safety standards for the maximum credible earthquake or for the Probable Maximum Flood and no longer provides a water supply, due to sedimentation in the reservoir. Two alternatives to retrofit this main stem dam are under consideration. These are: 1.) buttressing the existing dam and leaving it in place; and 2.) complete removal of the existing dam together with re-routing of the main stem into a parallel tributary (San Clemente Creek) . Both alternatives currently under consideration would result in an increased supply of sediment downstream of the dam, as the reservoir will no longer act as a complete sediment sink. The effect of this supply increase on habitat and sensitive species will depend on the quality, quantity, and travel time of the sediment passed downstream of the dam. It is beyond the scope of this project description to give a detailed analysis of the potential effects from a retrofit project. However, effects of past episodes of erosion and sedimentation and the existing condition of the channel give a starting point in describing potential effects.

Under what might be described as the “best” of circumstances, impacts could be short-term (a few years) and result in a slug of fine material quickly passing through the river channel before gravel and cobble is passed downstream. Past episodes of erosion indicate that such a condition temporarily reduces steelhead spawning areas and probably reduces food production in the river bottom substrate while fine material passes over the river bottom. However, once the supply of fine material is exhausted, normal river flows can reestablish habitat suitable for steelhead, often within one or two winter seasons. Moreover, fine material deposited at stream margins encourages rapid development of emergent wetland species and woody riparian vegetation.

At the other end of the range of effects, a sudden increase in the supply of sediment could overwhelm the transport capacity of the river for an extended period and result in extensive braiding, increased bank erosion, loss of riparian vegetation, decrease in spawning and rearing habitat, decrease in conveyance, and damage to public and private infrastructure. Episodes of erosion between 1978 to 1986 and again between 1993 to 1998 introduced nearly one million cubic yards of sediment into the stream. During this period, the channel was highly unstable. Recently (since 2007), the lower 16 miles of the river appears to have stabilized.

It is likely that most effects on the river from the completion of a project at San Clemente Dam will take several years to translate downstream. This would allow adjustments to be made during the review process for projects authorized under this RGP.

Water Supply Alternatives

The California State Water Resources Control Board has issued two orders that could substantially reduce the amount of water diverted from the Carmel Valley during the period that the RGP would be valid. If diversions are significantly reduced, streamflow and groundwater levels will likely increase in the critical summer and fall months when typically little or no rain falls. A reduction in water extraction is not likely to have an immediate effect on the scope of activities in this RGP. Changes to the river environment from an increase in streamflow are likely to occur over several years.

Increased streamflow, especially in the lower portions of the river, is likely to encourage encroachment of vegetation into the channel bottom over a period of several years. This may require additional or different types of vegetation management. Should this occur, reinitiation of formal consultation with Federal agencies may be required.

Other Influences

With an increase in streamflow, the need for restoration and repair activities may slowly decrease. However, stream instability is influenced by many factors, including floodplain encroachment and the retention of sediment in the upper watershed by main stem dams. These two influences are not likely to change in the foreseeable future and represent significant barriers to restoring a natural stream regime.

1.3 Project Background

Since 1984, MPWMD has constructed and regulated various restoration and maintenance projects along the Carmel River. Restoration projects have been carried out to repair eroded stream banks and to enhance the environmental quality of the river's natural resources, which include native riparian vegetation and several sensitive aquatic species. High flows in 1995 and 1998 resulted in more than 60 separate applications to MPWMD for repair projects. In 1995, the Monterey County Water Resources Agency and MPWMD cooperated to obtain a regional Corps permit that authorized all repair projects with a single permit (Permit File No. 217931S). In 1998, MPWMD obtained a similar permit on behalf of property owners who desired to complete repair work after high flows in February 1998 (Permit File No. 23783S).

In the past, restoration and maintenance projects along the Carmel River have been approached as individual projects, resulting in the expenditure of significant time and resources to secure necessary permits. Each project proceeded through the permitting process of several regulatory agencies, consuming valuable agency staff time. In most cases, projects were very similar to previously permitted projects, and obtaining permits to carry them out resulted in duplicated efforts. For these reasons, MPWMD consolidated permitting efforts and obtained RGP 24460S from the Corps.

In the 2004-2009 period under RGP 24460S, MPWMD sponsored vegetation management at 26 sites, carried out and assisted two private property owners with projects involving heavy construction equipment in the channel of the Carmel River.

For more than 25 years, MPWMD has implemented a long-term program to protect and enhance

Carmel River resources. In 1984, the Carmel River Management Plan (CRMP) was developed by MPWMD in response to a variety of problems along the Carmel River. The CRMP provided a comprehensive set of goals, specific policies and designs for restoration and long-term management of the river and its resources. After a number of technical studies were completed, the CRMP proposed a "Preferred Solution" using a combination of structural and biotechnical erosion control techniques to encourage a return to a stable system. Substantial improvements to riparian vegetation and fisheries habitat, reduction of bank erosion, and a return of channel stability were recognized as key components of the CRMP.

In November 1990, a Five-Year Mitigation Program was adopted by the MPWMD Board as a result of certification of the Final Environmental Impact Report (EIR) on the effects of the MPWMD Water Allocation Program, which includes the effects of diversion of water from the Carmel River Basin to meet the water needs of the community. In order to comply with State laws that require mitigation measures to reduce adverse impacts on the environment, MPWMD prepared and implemented the Mitigation Plan. When the Mitigation Plan was initiated in 1991, it incorporated several MPWMD programs that were already being implemented at that time, specifically the Carmel River Management Program and the Interim Relief Program. The Interim Relief Program (originally implemented by the MPWMD starting in 1988 to address drought impacts) was designed to benefit riparian vegetation and to maintain a viable population of steelhead in the Carmel River through implementation of a fish monitoring and rescue program, smolt transportation program, and by conducting an assessment of fish mortality at Los Padres Dam.

Since adoption of the first Five-Year Mitigation Program in 1990, MPWMD has implemented many river mitigation activities to improve the Carmel River environment, particularly for steelhead and riparian resources. MPWMD has also been responsible for the construction of several major restoration projects along the river.

1.3.1 Historical Channel Instability

Although riverbank erosion is a natural process, many types of natural events such as major floods, prolonged drought, and large landslides as well as human activities such as dam construction, logging, gravel mining, channelization, groundwater extraction, and urbanization have led to accelerated bank erosion and channel degradation along a large segment of the Carmel River. Extensive residential and commercial development (primarily golf courses and some agricultural-related businesses) has occurred within the flood plain of the Carmel River, particularly from RM 15.8 to the mouth of the river. Accelerated erosion and active channel widening have had adverse impacts on channel stability, riparian vegetation, fisheries and wildlife habitat, structures adjacent to the channel, and aesthetic values.

Widespread degradation and loss of riparian habitat, which has occurred on the Carmel River at moderate flows (less than a 10-year return event), directly impacts aquatic species, bird life, and other wildlife. Streambank erosion during winter flows has degraded aquatic habitat by filling pools

and spaces between the gravel, cobbles, and boulders needed by juvenile fish and the aquatic insects on which they feed. Loss of trees lining the streambank reduced the food supply for juvenile steelhead, increased water temperatures, and reduced the quality and quantity of habitat for steelhead, other aquatic species, and many diverse terrestrial species. More recently, continued loss of channel bottom material through erosion has exposed infrastructure (primarily bridges) to scour. Because the Carmel River and its alluvial aquifer is the largest source of potable water for the Monterey Peninsula, the natural recovery processes usually at work after an erosion event are interrupted by water extraction practices. Thus, in many areas along the river, restoration projects are necessary to aid the recovery of the riparian ecosystem.

A severe two-year drought in 1976-77, which devastated riparian vegetation, followed by high storm flows between 1978 and 1983 caused significant streambank erosion and severe degradation of stream-associated habitat between RM 15.5, at the upstream end of the Carmel Valley Village, and the Pacific Ocean. After the wet years of 1969, 1978, and 1983 caused widespread bank erosion, scientists identified more than eight miles of the Carmel River as needing restorative work. In 1984, MPWMD began the Carmel River Management Program to address the concerns of property owners, environmental organizations, and other groups interested in protecting and restoring the natural resources of the Carmel River. In 1986, the California Department of Fish and Game expressed concern that the steelhead population was threatened with becoming a remnant run. After a four-year drought ended in 1991, only one migrating adult steelhead was counted at the San Clemente Dam during the 1990-91 rainy season.

Since 1984, MPWMD has completed several river restoration projects totaling more than three miles along the river. Methods used include reestablishing natural channel geometry and meander pattern, installing native riparian vegetation, and enhancing fishery habitat. In 1995 and again in 1998, two very large runoff events caused extensive flooding throughout Carmel Valley, and bank erosion occurred along approximately 25% of the streambanks between RM 15.8 and the Pacific Ocean. With one exception, MPWMD restoration projects performed successfully during the large flow events, although numerous private parcels were severely damaged.

Prior to the implementation of the Carmel River Management Program, much of the work done by private individuals along the river was not designed and/or implemented properly. The piecemeal approach to bank protection created gaps, exacerbated problems in other areas of the river, or simply failed and had to be redone. Comprehensive management, as outlined in the MPWMD program, provides the framework for the progressive restoration of the river.

Periodic high river flows and occasional streambank erosion are inevitable, natural occurrences along the Carmel River. However, erosion will accelerate in areas where vegetation or debris creates obstructions that deflect river flows against adjacent and downstream channel banks. Along the Carmel River, streambank erosion has occurred in the past when woody vegetation in the middle of the riverbed collected flood debris or created water diversions that deflected river flows against unstable riverbanks. Woody debris lodged against bridge infrastructure built into the active channel has also caused bank loss.

MPWMD has found that the potential for bank failure is reduced by selectively removing portions of

the woody vegetation from the active river channel. Since 1990, the MPWMD has conducted an annual program to identify and remove potential river flow obstructions in the Carmel River. Each year, the entire river channel downstream of RM 15.8 has been inspected for potential hazardous conditions and specific problem areas have been identified. MPWMD has successfully reduced erosion hazards by trimming or removing woody vegetation growing in the middle of the stream channel, and by removing dead trees and flood debris that could block flows. Only material representing a bank erosion threat has been removed. Besides erosion hazard reduction for property owners, program objectives include maintaining aquatic habitat.

1.3.2 MPWMD Fishery Management

The fishery program includes extensive monitoring, fish rescue, rearing, spawning gravel replacement, and selective river modifications to improve passage. Adult steelhead returns at the San Clemente Dam fish ladder counter have fluctuated considerably since 1962. But, since a continuous monitor was installed in 1994, the count peaked at 874 in 1998 and has trended downward since 2001. In the "2009 Carmel River Steelhead Redds and Adult Fish Survey Summary," MPWMD Fisheries Biologist Beverly Chaney characterized the lower Carmel River in this way:

> "Overall, spawning habitat in the lower river below Boronda Br. (RM 12.7) was very good with abundant clean gravel available, even to the lower end of the RCGC [Rancho Cañada Golf Course] reach [between RM 2 and 3]. In fact, lower river spawning habitat was the best that staff has seen in over 15 years."

Juvenile densities in the lower 15.5 miles of the river appear to be similar to (in some reaches higher than) the reach from RM 16 through the upstream limit of San Clemente Reservoir (at about RM 20). Several observers have commented on the dense vegetation along the stream (the mapped area of the riparian forest increased by nearly 50% between 1986 and 2006). These are indications that stream restoration and vegetation management activities along the lower river are leading to improvements in the substrate and vegetative cover along the streamside corridor. The downtrend in adult returns is puzzling given what appears to be an improvement in habitat quality of the lower river. However, a combination of influences including (but not limited to) impacts from water diversions, inadequate fish passage into the upper watershed, lagoon management, and changes in the ocean environment may be affecting adult returns.

1.4 Other Applicable Permits

In addition to the Corps, several other agencies regulate maintenance and restoration activities within the Carmel River, including the California Department of Fish and Game (CDFG), the Regional Water Quality Control Board (RWQCB), the Monterey County Water Resources Agency (MCWRA), the Monterey County Planning and Building Inspection Department (MCP&BID), and MPWMD.

Concurrent with the application to the Corps, the MPWMD will seek authorization for maintenance and river restoration activities from the Central Coast Regional Water Quality Control Board (RWQCB) for Section 401 Certification or Waiver.

Pursuant to a Memorandum of Understanding (MOU) with the California Department of Fish and Game (CDFG), MPWMD has annually obtained a 1601 Streambed Alteration Agreement covering routine maintenance activities in flowing and dry portions of the Carmel River. MPWMD has obtained project specific 1601 Agreements from CDFG when work is proposed in flowing reaches of the river. Projects proposed by individual property owners are not included in MPWMD's current MOU.

Monterey County requires authorization from both MCWRA and MCP&BID to alter areas within the 100-year floodplain of the Carmel Valley, as defined in the Flood Insurance Study adopted by Monterey County in 1984.

MPWMD also regulates activities within the riparian corridor of the river, which, for MPWMD, is defined as the area extending from the Pacific Ocean to Camp Steffani (about RM 15.5) that is within 25 feet of the 10-year return flow level. At most locations along this portion of the river, the 10-year flow level coincides with the top of the highest bank adjacent to the river.

2.0 SUPPLEMENTAL INFORMATION FOR CORPS PERMIT APPLICATION

This section provides the Department of the Army Permit Application and information requested in Blocks 13 and 15-25 of the most recent (February 1994) application form. It includes information concerning the:

1) name of all water bodies directly impacted by the activity (Block 13);
2) location of the proposed project and directions to the site (Blocks 15-17);
3) nature of the activity (Block 18);
4) proposed project purpose (Block 19);
5) reason(s) for the discharge (Block 20);
6) types(s) of material being discharged and the amount of each type (Block 21);
7) surface areas of wetlands and other waters (Block 22);
8) portions of the work already complete (Block 23);
9) names and addresses of adjoining property owners (Block 24); and
10) approval or denials by other agencies (Block 25).

2.1 Department of the Army Permit Application (ENG Form 4345) – see cover letter

2.2 Water Bodies Impacted (Block 13)

The Carmel River drains about 255 square miles and can be broadly divided into three distinct reaches: from River Mile (RM) 0.0 at the Pacific Ocean to the Narrows at RM 10 is considered the lower Carmel River; the middle Carmel River is from the Narrows to San Clemente Dam at approximately RM 18.6; and the upper Carmel River is from the San Clemente Dam to approximately RM 36, which is in the Ventana Wilderness near the highest point in the drainage basin (Attachment 1, Figure 1).

Most of the river upstream of the Stonepine Resort bridge at RM 15.8 is quite rugged and is in canyon and bedrock control. Downstream of this area, the river flows across a broad alluvial valley (the Carmel Valley). Annual rainfall varies from about 14 inches at the coast to more than 40 inches at the headwaters in the Santa Lucia Range. The basin is considered flashy, as the river rises quickly in response to significant amounts of rainfall. The largest flow on record occurred March 10, 1995 and was estimated to be approximately 16,000 cfs at RM 14 (or about a 70-year event according to the revised Flood Insurance Study for Monterey County). Extensive residential and commercial development has occurred within the floodplain in Carmel Valley, particularly from RM 15.8 to the mouth of the river. Approximately 700 structures could be vulnerable to flooding and erosion damage during the 100-year runoff event.

The alluvium downstream of RM 15.8 is composed primarily of noncohesive sands, gravels, and cobbles that washed down from the upper watershed into the lower and middle river prior to the construction of two mainstem dams (San Clemente Dam and Los Padres Dam). Channel bottom slope ranges from about 0.2 % at the ocean to 1.0% near RM 15.8. The channel forming, or dominant, discharge is about 2,500 cfs. Bed forms range from dunes near the ocean to an incised, boulder strewn bottom at RM 15.8. Much of this portion of the river is moderately entrenched into a terrace created before installation of the two dams. MPWMD's research shows that the river may have incised up to 13 feet (4 m) at RM 14 between the early 1900's and the 1980's.

Downstream of RM 15.8 the river is in a transition zone between an unstable, braided channel and a stable, meandering, single thread channel. Along most of the lower Carmel River, the presence of healthy streambank vegetation is a factor in forming and maintaining a single thread meandering channel. Between RM 15.8 and the Narrows, channel braiding is the more likely configuration, which may be due to a combination of higher stream power, changes in sediment supply, and installation of structural erosion protection (e.g., rip-rap and concrete rubble). Artificial constraints may be causing braiding as banks downstream of a constrained area are eroded and gravel bars are deposited in response to a change in channel geometry and/or changes in sediment supply. Braided areas are dynamic with high rates of erosion, and loss of property and riparian habitat. Meandering areas have typically been more stable at high flows and offer more mature riparian areas and more aquatic features (pools, riffles, substantial cover). Healthy riparian habitat protects property and supports a diverse wildlife population along the Carmel River, including two special status species, steelhead and California red-legged frog.

A visual evaluation of the geographic extent of wetlands and other waters of the United States under

Corps jurisdiction, as defined by the Corps of Engineers 1987 Wetland Delineation Manual, will be made within proposed project sites on a case by case basis. Based on information gathered during the evaluation, jurisdictional wetlands and waters located below the plain of ordinary high water will be identified within the project areas.

2.3 Location (Blocks 14-17)

The project site includes an 18.6-mile segment of the Carmel River in Monterey County, California (Pacific Ocean to Sleepy Hollow). The project location extends from RM 0 at the Carmel River lagoon to RM 18.6 at the San Clemente Dam (**Figure 2**). Proposed projects would most likely be located in the river channel and bank area, and on floodplain terraces where appropriate.

2.4 Nature of the Activity (Block 18)

Proposed activities include routine maintenance activities, coupled with revegetation and restoration actions that will assist District staff in river management efforts.

The project includes the following components;

- Fisheries Habitat Enhancement (section 2.4.1)
- Riparian Habitat Restoration (section 2.4.2)
- Bank Stabilization (section 2.4.3)
- Channel Restoration (section 2.4.4)
- Vegetation and Debris Maintenance (section 2.4.5)

The purpose of the Permit for the following activities will be to carry out restoration and enhancement projects in a more holistic, or river-wide, approach. It should be noted that bank erosion or channel instability is very difficult to predict, and that the locations where these impacts occur in a particular runoff event or season depend on local bank, hydraulic, and sediment transport conditions. To better understand the types of impacts and projects that could be required, the following descriptions are provided.

Activities associated with this permit are designed to work together in a comprehensive approach to channel maintenance and restoration. In general, there will be a need to combine several activities to carry out a successful project. For example, restoration of a functioning floodplain would require excavation, fill, erosion protection, revegetation, irrigation, and maintenance within the active channel. Such a project would likely be successful only if all activities are carried out to the fullest extent possible.

Most projects would likely occur in degraded areas. In many cases, degraded areas of the river exhibit three characteristics - little or no riparian vegetation, unstable (steep) streambanks, and large mid-stream gravel bars. Short term project impacts in areas with perennial flow could include dewatering, a reduced food supply and habitat for aquatic species, and substrate disruption. Based on MPWMD experience with these conditions, these short-term impacts appear to last until flows mobilize a portion of the bed and bring in aquatic organisms. Typically, this would occur at flows above 300 cfs, which can occur within weeks after a project is completed.

Longer term impacts could occur from the removal of mature riparian vegetation. This could occur as a result of grading to construct floodplains or rebuild streambanks. Most mature riparian vegetation that would be removed exists in sparse, unevenly distributed, and discontinuous stands. Typical revegetation efforts would result in post-project health, density, and diversity of vegetation that would likely be greater than pre-project, but would likely take three to ten years to mature and provide significant shade and cover.

Mature vegetation and large woody debris might be trimmed or mechanically removed for erosion prevention. No mitigation for environmental impacts (e.g., loss of habitat) is proposed for this type of channel maintenance; however, MPWMD notes that accumulations of debris and encroachment of live vegetation into the active channel can cause significant local scour and streambank failure during high flows. Only material that poses a threat to bank stability would be removed.

Excavation activities could also include the use of a backhoe to dig planting holes for trees and for strategic placement of large boulders and/or logs. Prior to the start of channel grading work, salvageable vegetation along the project reach may be removed with mechanized equipment and relocated within the project or disposed of outside the channel. In areas where the banks have been severely eroded, imported fill or channel material may be use as backfill material. Fill material required for bank stabilization projects may include rock slope protection, gabion baskets, natural vegetative or other suitable material. Fill material could also include a mix of native sand, gravel, and topsoil that would be placed over rip-rap and along graded banks.

Temporary impacts due to construction activities can be minimized by carefully choosing the time of year and flow condition to work in. Weather and river flow in the Carmel Valley are highly variable and conditions can change quickly. While the rainy season frequently begins in October, the onset of significant rainfall (and thus, runoff) has been as late as March. The end of the rainy season is usually in April, but significant rainfall can occur in June. The lowest flows in the river are usually recorded in September as aquifers are depleted and riparian vegetation is still evapotranspiring significant amounts of moisture. River flows usually rise slightly in October and November as evapotranspiration and ground water pumping is reduced.

Excavation and Backfill

Grading of the river banks may be required to recontour or reduce the slope of the existing bank to 2:1 or flatter. In cases where the river bank has been severely eroded, the toe of the bank may be stabilized by excavating a trench, up to several feet deep, below the adjacent channel bottom and

backfilling the trench with rip-rap or other suitable material to prevent future scour. Material excavated from such trenches would normally be placed on the streambanks. It should be noted that all rip-rap projects conducted under this permit would incorporate bioengineering techniques (see "Slope Protection" section). This technique has proven effective in preventing undercutting and slope failure. In addition to these activities, sandbar material may be relocated to enhance the river channel.

Excavation of sand and gravel bars may be carried out to realign the active channel into a more stable configuration. This is a key component of reestablishing meander geometry and recreating low-lying floodplain area. A "low-flow" channel, capable of carrying dominant or frequent flows (1.5 -to 3.0-year events) is excavated within the channel bottom. This low-flow channel meanders back and forth within the main stem and generally has a wavelength of between 1,000 and 2,000 lineal feet. The amplitude of meanders is frequently dictated by existing constraints; however, where possible, an increase in amplitude would be desirable. For large restoration projects, this activity is frequently combined with installation of erosion protection at critical areas, such as at the outside of meander bends.

Importation of Fill Material

Areas with significant loss of property could be backfilled to a pre-loss configuration with sand, gravel and soil material obtained from off-site sources. As with excavation and backfill activities, streambank areas could be stabilized with structural and/or biotechnical erosion protection in key areas.

Slope Protection

An emphasis will be placed on the use of bioengineering techniques. Use of rip-rap, gabion baskets, or other traditional slope protection will be limited to the following areas:

1) active channel slopes within 25 feet of structures;
2) areas that are four (4) feet vertically below the toe and up to eight (8) feet vertically above the toe of the active channel;

Note: The active channel refers to the lowest portion of the main stem channel that is occupied by flows of between the 1.5-year and 3.0-year return frequency. Generally, for the Carmel River, this is the area within the bottom of the channel that is inundated by four to eight feet (vertically) of flow. This corresponds roughly with the Corps of Engineers wetlands jurisdictional limit.

The majority of these sites are located on the outsides of meander bends, or in areas where bank vegetation has eroded away. Slopes protected by structural erosion protection will be built at a 1.5:1 (horizontal to vertical) grade or flatter.

Other slope areas will be constructed at a 2:1 (horizontal to vertical) grade or flatter. Erosion protection installed on these slopes could be geotextiles, live plant material, logs, rootwads, or other

flexible type of erosion protection. At the outside of bends and in critical erosion areas, a combination of erosion resistant materials, log deflectors, rip-rap and vegetation will be installed to provide bank protection in case of high flows. This structural protection will eventually blend into vegetation planted on the bank and along the toe of the riverbank. Banks and low floodplain terraces will be revegetated with willow, cottonwood, sycamore, box elder, elderberry, and other native riparian species. Special emphasis will be placed on revegetation with plant species which are appropriate for the restored bank or terrace elevation and moisture condition. Vegetation will be drip irrigated for three years (if needed). The integration of top soil into the slope assists in the retention of moisture, and provides a more nutrient-rich medium for root development. In several of MPWMD's restoration areas the willows are sufficiently large that cuttings for other projects can be taken. These techniques should eventually result in a less uniform appearance and maintain the willows on the lower slope in a more bushy condition rather than allowing tall trees to develop. Plants along the upper part of the slope will be allowed to grow freely. Erosion protection installed along the outside of meander bends will consist of granite rip-rap in the 1/4-to 3-ton class.

All graded slopes, including rip-rapped areas, will be revegetated with appropriate native riparian vegetation on a four to seven foot grid. Special emphasis will be placed on revegetation with native plant species that are appropriate for the restored bank or terrace elevation and moisture condition. As a component of reestablishing native riparian cover, an irrigation system will be installed (if needed), operated, and maintained for a minimum of three years. MPWMD standards for the Carmel River include replanting of native riparian vegetation in areas that do not achieve a 70% success rate by year three after initial planting.

The implementation of both structural and biotechnical bank stabilization techniques will result in similar impacts to Corps jurisdictional areas. Temporary fill for access may be required to allow equipment into the work area. Impacts could include excavation and fill necessary for a temporary flow diversion structure (if necessary). Grading of the river banks may be required to recontour or reduce the slope of the existing bank below OHW. In cases were the river bank is being severely undercut or eroded, the toe of the bank may be stabilized by excavation of a trench, up to several feet deep, below the adjacent channel bottom and backfilling the trench with rip-rap and/or incorporating a biotechnical method to prevent scour. Excavation activities could include the use of a backhoe to dig planting holes for trees and to trench irrigation lines. Prior to the start of channel grading work, salvageable vegetation along the project reach may be removed with mechanized equipment and relocated within the project. In areas where the banks have been severely eroded, channel or gravel bar material may be excavated, stockpiled and used as backfill material. Fill material required for bank stabilization projects may include rock slope protection, vegetative material and other material such as boulders and logs. Fill material could also include topsoil that would be placed over rip-rap and along graded banks.

Vegetation Removal

Where needed, vegetation removal in the active channel will be kept to the minimum necessary to reduce obstruction of river flows and the potential for bank erosion. Vegetation cutting will be done by hand crews using hand tools and hand-held power tools, and cleared material will be chipped on the terraces above the riverbank or utilized in bank stabilization projects elsewhere along the river. Material that is too large to chip will be bucked (or cut) into short lengths, and some material may be burned. Some cottonwood and willow saplings may be salvaged and replanted to stabilize eroded banks within the project site. Mechanized equipment may also be utilized to remove fallen trees, debris, and to clear critical areas for the placement of slope protection.

When appropriate, large woody debris that poses a potential erosion hazard will be notched or bucked up and left in place. Notching causes the debris to break up and float away during high flows.

Temporary Diversion Channel

Where necessary, in order to divert flow around a work site in areas of perennial flow, a trench will be excavated, usually in a dry portion of the channel bottom, to pass flow around the site. Material excavated from the trench (primarily sand, gravel, and cobble) will be used to temporarily block the bottom of the channel and divert flow into the excavated trench for the duration of the project. After construction is completed, the diversion berm is normally removed and the excavated trench area filled in to pre-existing contours.

Channel Realignment

Project work starts by surveying and staking out project boundaries to prevent heavy equipment operation outside the work area. The contractor begins grading by scraping off the "upper" layer of the riverbed, which contains the largest proportion of cobbles and gravel. This material is stockpiled for later use as a finishing layer to promote steelhead spawning and to form a restraint to bed mobilization. Deleterious material, such as auto parts, various metal objects, and refuse will be hauled away to an appropriate dump site outside Corps jurisdiction. A channel of appropriate dimensions will be graded in the stream bottom. The finished channel will be designed to carry excess sediment stored in point bars located within and upstream of the project. Material excavated from the channel can be used to buttress eroded slopes and to build an active floodplain for vegetation plantings. After completion of this work, a smaller pilot channel is excavated within the main channel. This pilot channel provides fish passage for migrating steelhead during periods of low flow. Pools are excavated at appropriate intervals (usually five to seven channel widths) to provide areas for migrating steelhead to rest and feed and to provide habitat for California red-legged frog. In most areas the finished stream bottom will be at or near the elevation of the existing channel bottom.

Excavation and fill activities required to implement channel restoration projects will result in impacts to Corps jurisdictional areas. In most cases, large equipment such as a front end loader,

dump truck, backhoe, bull dozer or excavator will be used to restore channel geometry to a more stable alignment.

Temporary fill for access may be required to allow equipment into the work area. Impacts could include excavation and fill necessary for a temporary flow diversion structure (if necessary). Prior to the start of channel grading work, salvageable vegetation within the project reach may be removed with mechanized equipment and relocated to those bank stabilization project areas. Projects normally include excavation of a narrow stable channel, excavation of a meandering low-flow channel with a pool and riffle sequence, excavation of gravel bar material, and replacement of cobble and gravel material along the channel bottom. During excavation, substrate material is stockpiled at the beginning of grading and replaced during final grading operations.

2.4.1 Fisheries Habitat Enhancement

Improvement of degraded anadromous fisheries resources in the lower Carmel River watershed has long been considered a primary goal of MPWMD's river restoration program. MPWMD has estimated that at the turn of the century, more than 4,000 steelhead migrated annually. The run almost became extinct during the 1980's. In 1991, only one returning adult was counted at the San Clemente Dam fish ladder at RM 18.6. In July of 1996, the National Marine Fisheries Service listed the steelhead as a threatened species under the protection of the federal Endangered Species Act. Because of local efforts to revive the run, including past District restoration projects and a series of wet years in the 1990's, 775 returning adults were counted at the San Clemente Dam fish ladder during the 1996-1997 rainy season. During the 1997-1998 season, 874 were counted, flowed by a second peak of 804 in 2001. However, since then the adult run numbers have predominantly trended down and in 2009, only 95 adults were counted at the fish ladder. Through February 10, 2010, 54 adults had been counted in the 2009-2010 season. Based on past trends in the steelhead run, a partial rebound in the number of adult steelhead returning may be underway.

The Carmel River supports the largest self-sustained steelhead resource south of San Francisco. However, this resource is in danger as essential habitat has been or is being degraded or destroyed by floodplain encroachment, bank erosion, and water development. Protection of existing habitat and restoration of degraded habitat is a primary requirement of a successful solution to steelhead population enhancement. Fortunately, almost any restoration scenario has the potential to enhance upstream and downstream migration and spawning conditions if done properly. Several preferred solutions have been recognized that would enhance river and fisheries resources in several ways.

By confining the river to a central stable low-flow channel, the currently existing "critical" riffles would be eliminated for the most part, greatly improving migration at low flows. Critical riffles occur as sediment is deposited on debris and vegetation impeding downstream flows. This effectively aggrades the channel and forces the stream flow to assume a shallower and wider condition. As has been observed, fish migration problems can occur over these riffles even at a flow of 100 cfs.

Several activities are proposed by MPWMD to enhance or restore steelhead habitat. Fish habitat

enhancement projects include excavation of a temporary flow diversion (if necessary), excavation of meandering low-flow channels with a pool and riffle sequence, placement of log and boulder groups at erosion protection locations to provide additional habitat, replacement of gravel material along the channel bottom, and revegetation of riparian habitat along the banks of the river. These actions will reduce the potential for bank erosion, which introduces fine sediment and can degrade aquatic habitat.

The reestablishment of a natural pool and riffle sequence improves habitat and migration conditions. Pools provide cool water for fish to rest in during upstream migration at low flows when other parts of the river become too warm. Additionally, the natural pool-riffle sequence provides both better sediment transport characteristics and an initial basis for the development of a stable low-flow channel.

The reestablishment of vigorous riparian vegetation along the stream banks improves fish habitat in a number of ways. Vegetation provides shade, which is very effective in reducing average water temperatures, particularly in the spring and summer. Vegetation encourages the reestablishment of animal and insect habitat, which leads to a better food supply for the fish. Riparian vegetation adjacent to the low-flow channel provides cover and better protection from predators.

Temporary fill for access roads may be required to allow equipment into the work area. During excavation, substrate material would be stockpiled at the beginning of grading and replaced during final grading operations. Impacts from disturbance of the existing substrate from grading operations are likely to be short term and minor since most of the work would be conducted during periods of low flow.

2.4.2 Riparian Habitat Restoration

Vegetation observed along the upper section of the Carmel River is characteristic of that considered to be good quality riparian habitat. Generally, riparian habitats along the middle and lower sections of the river consist of narrow strips of riparian scrub and woodland, with some discontinuities. Between 1998 and 2010, vegetation has encroached toward the center of the stream with the result that the need for management activities to reduce the potential for debris dams in winter has increased. Although areas of good quality habitat occur in the middle and lower sections, they are vulnerable to fragmentation and disruption from groundwater pumping, floodplain development, channelization, and property owner alteration of streambanks and terraces.

The presence of riparian bank vegetation can make the difference between a narrow, stable channel and a wide, braided, and shifting one. Aerial photographs from 1965 and earlier show a stable channel flanked by a well-developed riparian corridor in the lower Carmel Valley. Established riparian vegetation has proven to be an effective deterrent to stream erosion; the mat-like roots of most riparian species bind together loose channel banks, and foliage tends to slow the velocity of storm flows. MPWMD selectively irrigates mature streamside vegetation and newly established restoration plantings in order to maintain a healthy, vigorous riparian corridor both for erosion protection and habitat enhancement.

The primary objectives of planting native vegetation are to stabilize eroded stream banks and to enhance wildlife habitat values on floodplain and terrace areas. One of the important goals of the habitat enhancement effort is to diversify the restoration plantings by identifying microhabitat areas and planting them with species typical of those riparian habitat sites. Revegetation efforts incorporate understory shrub and grass species, and an assortment of native tree species into the standard planting palette of willows and cottonwoods traditionally used in riparian restoration efforts.

There are many advantages to using vegetation to protect the river banks and encourage the river into a stable channel pattern: (1) it enables the reestablishment of the natural riparian corridor and promotes a stable channel, enhanced fish and wildlife habitat and improved aesthetic values; (2) it is a relatively low cost solution compared with entirely structural solutions; (3) it improves water quality; (4) it reduces erosion-related costs for MPWMD, Monterey County and private landowners; (5) it fosters development of a dense root network, which binds bank materials and greatly increases the resistance of the bank to shear stress; (6) the presence of many stems, branches, and the attendant foliage can dramatically increase the hydraulic resistance to flow and thereby reduce velocities along the bank, which in turn may lead to the deposition of sediment; and (7) the flexible nature of the vegetation tends to protect the banks from the abrasive forces of the stream's debris load. A disadvantage of a vegetative approach to the problems of the Carmel River is the lack of immediate protection. There is also no guarantee that the vegetation will become established with sufficient vigor to withstand high storm flows during the first few winters.

Various techniques for vegetation installation have been employed at MPWMD restoration projects. Planting techniques involve either rooted seedlings or pole cuttings sustained by irrigation, or deeper plantings set to tap summer groundwater without supplemental water applications. Irrigation techniques include standard drip and overhead sprinkler application. Species used for revegetation efforts are native to the Carmel River drainage basin. Species planting densities vary depending upon topography, channel condition, and soil moisture availability.

The use of vegetation for bank stabilization along the Carmel River can be a very cost-effective method of erosion control. A drawback to use of a vegetative-only approach is the difficulty of establishing the vegetation so that it can stabilize streambanks against erosion. Willows and other tree species need several seasons of undisturbed growth to develop extensive root systems that will protect the river banks. During the first few seasons, plantings are vulnerable to high flows, drought, animal browsing and animal and/or human trampling. While these factors may be taken into account and the vegetation protected against them as much as possible (e.g., with biodegradable meshes), a significant chance remains that storm flows will occur during the first few winters which would damage or destroy a large amount of the vegetative works. Damaged areas must be replanted and this process can continue for several years until a series of moderate winters provides favorable conditions for growth. Severely eroding bends or other critical areas may require protection with other means, though vegetation can be used to supplement these structural works.

Riparian restoration project impacts from planting will normally occur on the channel banks, both above and below the line of ordinary high water (OHW). Several activities required to implement riparian restoration projects may require work within Corps jurisdiction. Grading of the river banks

may be required to recontour or reduce the slope of existing bank. Excavation activities could include the use of a backhoe to dig planting holes for trees and to trench irrigation lines. Fill material such as sands and gravels from river deposits may also be placed below OHW. Prior to the start of channel grading work, salvageable vegetation along the entire project reach may be removed with mechanized equipment and relocated to restoration areas along the river.

2.4.3 Bank Stabilization

A fundamental problem along the Carmel River is the wide range in the sediment transport capacity from a supply limited stream to a transport limited stream. In both cases, a significant problem along the lower river is bank erosion, which has occurred at relatively low flows, generally along non-cohesive, unprotected banks. The stream tends toward being supply limited as a result of sediment retention at the main stem reservoirs. When this occurs, the river incises into floodplain deposits and eventually develops a narrow, single-thread channel that can be unstable at high flows. Various influences, including tributary sediment input and main stem bank erosion can change the stream to being transport limited.

When bank erosion takes place (in either the main stem or tributaries), it can introduce large amounts of sediment into the channel which then move downstream and causes further erosion or instability. This describes a positive feedback loop or a potentially self-perpetuating system. Once the sediment is in the river channel, it will move downstream as long as the transport capability of the riverflow exceeds the amount of material. If flow decreases below a given value (which is dependent upon the amount of sediment being transported) material will be deposited. This may cause the development of sand bars and localized channel aggradation. This, in turn, elevates water levels and can cause the flow to impinge on areas that are not protected. It can also cause an increase in the forces directed against a given bank, which may then exceed the binding forces. Aggradation can thus redirect the river's course and the impact of its flows. Erosion problems should be treated as they occur at a relatively small scale, rather than waiting for more severe conditions to develop that require emergency action and more expensive, environmentally damaging solutions.

The effects of bank erosion and the corresponding downstream sedimentation problems can vary from minor to severe. Severe erosion creates additional locations of channel or bank instability. There is also an effect on flood hazard, which is increased by substantial channel aggradation. Excess channel material, particularly sand-sized material (the most easily moved) can severely impact downstream fish habitat. A sand bed river discourages spawning and also causes problems for the rearing of young fish. Bank erosion causes general degradation of the resource, loss of riparian vegetation, decrease in aesthetic values, along with other secondary impacts.

In the early 1970s it was recognized that traditional engineering methods for the control of fluvial erosion which emphasized the use of structural materials and channelization techniques could have serious environmental consequences. Since then, alternative techniques for the restoration of rivers and streams have been developed using either "biotechnical" methods (the combination of structural elements with live plant materials) or methods involving the use of only natural materials. These new methods have been applied in the context of an improved understanding of the morphological

characteristics and functioning of natural channels.

Both traditional civil engineering methods (i.e., use of material such as rock rip-rap) and bioengineering techniques (i.e., use of live plant material either alone or in conjunction with inert materials), are proposed for use in bank stabilization and erosion control projects along the Carmel River. Stabilization activities require reduction of some channel bank slopes to 1.5:1 (horizontal to vertical) or flatter slopes of 2:1. Flatter slopes are preferred. Bioengineering techniques include construction of brush mats, brush layering, willows embedded in rip-rap, and planting and seeding, among other methods. Those areas stabilized with bioengineering techniques will contribute to the overall habitat restoration efforts of the Carmel River.

Biotechnical methods bring together the best of both the structural and vegetative solutions discussed previously. The result is an attractive, environmentally compatible and cost-effective means of providing satisfactory bank protection works along the reaches of the Carmel River currently experiencing severe erosion. These methods can begin the work of retraining the river to a stable configuration.

The advantages of a biotechnical approach are: (1) structural and vegetative components provide natural reinforcing, adding to the strength and integrity of the entire system; (2) field studies (Gray and Leiser, 1982) have shown that in many instances this combined approach is more cost-effective than the use of either vegetation or structures alone; (3) biotechnical protection systems are environmentally compatible, and in most cases enhance the existing environmental situation; (4) this approach emphasizes the use of local, natural materials, which are generally more aesthetically attractive; and (5) biotechnical systems tend to be more labor-skill-intensive rather than energy-capital-intensive, such that well-supervised skilled labor can be substituted for high-cost, energy-intensive materials.

The disadvantages of this type of approach lie mainly in the tradeoffs between cost and short-term effectiveness. Costs will be decreased if the ratio of structural to vegetative works is reduced, although the effectiveness of the works might also be reduced, at least until the vegetation is securely established.

The biotechnical method has a wide range of possible designs. Virtually all of the structural works can be adapted to the biotechnical approach. Certain design changes need to be made in each case to allow for the efficient propagation of vegetation. The options available range from a design that is mostly vegetative with limited structural works where necessary to substantially increase the survival quotient of the vegetation, to a design that is mostly structural with the vegetation relegated to a secondary role.

2.4.4 Channel Restoration

Restoration of a fully functional riparian corridor is severely limited by floodplain development along most of the lower 15.8 miles of the river. However, in areas where structures are not threatened, restoration projects will be designed to allow active channel migration.

Channel restoration projects include most, if not all, activities previously discussed in this section. Any solution must effectively address chronic bank erosion and incision within the active channel and provide a comprehensive approach to channel restoration. Unless a dynamically stable channel can be created, large mid-channel and point bars will evolve, migrate downstream, and redirect flow against the banks, which will start the channel widening process over again. This will prevent the reestablishment of vegetation and continue the supply of a large volume of sediment through bank erosion.

A comprehensive solution must attempt to balance changes in the delivery of sediment. In some areas, proposed work may involve realigning the lowest portion of the channel into a narrower watercourse capable of carrying any excess sediment (if it is present in the riverbed). In other areas, a lack of sediment may require the installation of features that would trap sediment and rebuild the channel bottom naturally. The relocation of the riverbed will follow, where possible, the channel configuration that was present from the 1930's until the mid-1960's. The channel during this period was considered stable even at high flows. Channel grading will include recreating a pool-riffle sequence and low-flow fish migration channel. An important component of channel restoration involves creating floodplain areas that convey overbank flows.

2.4.5 Vegetation and Debris Maintenance

Since fall 1990, MPWMD has carried out annual maintenance of the channel along portions of the Carmel River to reduce the potential for bank erosion and to maintain channel capacity. MPWMD targets vegetation that will not bend or flex in high river flows; material is removed that could potentially collect debris or deflect high water onto adjacent stream banks, thereby inducing erosion and degrading streamside habitat. Only woody plant material representing a bank erosion threat is removed. In addition to erosion hazard reduction for property, objectives include removing trash and inorganic debris from the river channel, and maintaining aquatic habitat for fish.

In order to minimize bank erosion, vegetation may need to be managed (controlled and/or removed) along the channel bottom. Vegetation growth and sediment deposits trapped by vegetation can decrease the capacity of the river channel to pass flow and debris. The objective of in-channel vegetation management is to reduce potential erosion and possible bank failure.

Channel vegetation removal will be kept to the minimum necessary to reduce obstruction of river flows and the potential for bank erosion. Streamside plants growing on adjacent riverbanks would not be affected. Vegetation cutting will be done by hand crews using hand tools and hand-held power tools, and cleared material would be chipped on the terraces above the riverbank or utilized in District bank stabilization projects elsewhere along the river. Material that is too large to chip will be bucked (or cut) into short lengths, and some material may be burned. When appropriate, large woody debris will either be left in the channel or notched so that it will break apart if mobilized. Some cottonwood and willow saplings that have become established in the low flow channel of the river will be salvaged and replanted to stabilize eroded streambanks. Mechanized equipment may also be utilized in dry reaches of the river to remove rootballs of riparian trees (primarily willow ssp.) that have colonized mid-stream gravel bars.

Large debris jams and stumps may be removed with a backhoe. Equipment in the channel may include 4-wheel-drive trucks, a wood chipper, and a backhoe. Only existing access points will be used for equipment entering and leaving the river channel. Vegetation on the banks will be left in place to maintain channel stability. District staff generally will begin channel clearing work on or about August 1 and may be assisted by crews from the California Conservation Corps and the California Department of Forestry and Fire Protection.

2.5 Project Purpose (Block 19)

MPWMD seeks to continue to restore, maintain, enhance, and comprehensively manage the riparian corridor of the lower 17.6 miles of the Carmel River. Specific goals include protection of life and property, restoration of river banks and scenic resources, reduction or reversal of environmental degradation, and enhancement of aquatic and wildlife habitats.

Most projects that would be covered by a long-term Permit are similar to projects previously authorized. A long-term Permit would consolidate various activities into one permit and streamline the normal review and authorization process with the Corps of Engineers and other federal agencies and the Regional Water Quality Control Board. In addition, this would facilitate a single comprehensive Section 7 consultation process with the U.S. Fish and Wildlife Service and National Marine Fisheries Service for project impacts to California red-legged frog and steelhead along the 17.6-mile reach of the Carmel River proposed for this permit.

2.6 Reason (s) for the Discharge (Block 20)

Several factors (see Section 1.3a) caused the Carmel River to change from a relatively stable, meandering single thread channel flanked by dense riparian vegetation in the early 1960's to a degraded, unstable river in the late 1990's. To improve this situation, the MPWMD implemented a program in 1984 to restore and manage the river. Both active and passive management activities are conducted along the river. Active management includes the use of heavy construction equipment to excavate and fill in the active channel, which is in the Corps' jurisdiction.

Discharges of fill material into "waters" of the United States are proposed in order to continue management activities within the Carmel River. Discharges into jurisdictional wetlands/waters may be necessary to accommodate proposed projects. Excavation and fill activities may result in a temporary disruption of channel bank and bottom areas during project construction and in long-lasting relocations of the active portion of the channel.

Excavation and fill activities are described in Section 2.4 "Nature of the Activity"

2.7 Type (s) and Amounts of Materials Being Discharged (Block 21)

Excavation within the project areas will amount to the removal of mostly bank and channel bottom

material composed primarily of sand, gravel, cobble and boulders. Excavated areas may be backfilled with rock riprap, gabion baskets, imported soils, and material excavated from on-site. All excavated material will be used on site. Construction of temporary diversion structures may require that fill material (river gravels) be placed into jurisdictional waters. This material will be removed after construction is complete.

Erosion and siltation controls will be used and maintained during construction to prevent additional sources of fill from entering the active channel of the river. In order to prevent erosion and siltation from occurring during construction, the projects will be constructed during periods of low flow. Exposed soil will be permanently stabilized following construction. Soil stabilization measures include installing silt fences where appropriate reseeding the construction area after work is completed, and revegetating all exposed slope and terrace areas.

Projects proposed under this permit will allow for the restoration of fisheries and riparian values, as well as restoring stability to those areas of the Carmel River channel that have historically suffered from severe bank erosion and are currently in a degraded state. In most cases, fill material for proposed restoration projects will be obtained from nearby gravel bars and will consist of clean sand, gravel and cobble material. Imported fill material will not contain toxic pollutants and will be free of trash and other debris. Large boulders and/or logs, rock rip-rap, and topsoil material will be obtained from local sources.

2.8 Surface Areas of Wetlands and Other Waters of the United States (Block 22)

A visual evaluation of the geographic extent of wetlands and other waters of the United States under Corps jurisdiction will be made within the proposed project site by an experienced biologist. Proposed projects could result in impacts to jurisdictional waters located below ordinary high water within the Carmel River. Impacts to jurisdictional waters include activities within the active Carmel River channel, smaller secondary channels, and sandbar and river bank areas below ordinary high water. A visual evaluation of all proposed project sites will identify areas containing wetlands/waters as defined by the Corps of Engineers 1987 Wetland Delineation Manual.

2.9 Portions of the Project Already Completed (Block 24)

No projects have been constructed under this permit application.

2.10 Names and Addresses of Adjoining Property Owners (Block 25)

The names and addresses of adjoining property owners are presented in Attachment 6.

2.11 Approvals or Denials by Other Agencies (Block 26)

No federal approvals are required other than the Corps permitting process and the 401 water quality certification process. Coordination with the Central Coast Regional Water Quality Control Board

(RWQCB) for Section 401 Certification or waiver is occurring concurrently with the Corps of Engineers 404/10 permit application. MPWMD will coordinate Section 401 Water Quality Certification application with the RWQCB.

2.11.1 California Department of Fish and Game 1601 Streambed Alteration Agreement

MPWMD has entered into a Memorandum of Understanding (MOU) with the California Department of Fish and Game (CDFG) regarding streambed notification and routine maintenance and restoration activities subject to CDFG Code Section 1601. MPWMD annually obtains a 1601 Streambed Alteration Agreement from CDFG pursuant to this MOU.

2.11.2 Regional Water Quality Control Board 401 Certification

MPWMD obtained an Order for a Technically Conditioned Certification from the Central Coast Regional Water Quality Control Board (RWQCB) for RGP 24460S. MPWMD will request an amendment to that certification concurrently with this Corps permit application.

2.11.3 California Department of Parks and Recreation Access Agreement

If work is proposed to be carried out within the Carmel River on State Parks property, MPWMD will obtain an Access Agreement for the period of time required to complete the work. An agreement will be obtained annually if needed prior to work occurring on State property.

2.11.4 Monterey County Use Permit

The Monterey County Planning and Building Inspection Department requires a Use Permit or administrative approval to conduct certain activities within the channel and 100-year floodplain of the Carmel River. MPWMD will continue to acquire project-specific permits when needed.

2.11.5 California Environmental Quality Act

CEQA review was conducted in 1984 for the Carmel River Management Plan, the governing document for District projects. The Carmel River Management Plan was subsumed into the Allocation EIR Mitigation Program after the Allocation EIR was certified in November 1990.

2.11.6 State Water Resources Control Board

State Water Resources Control Board Decision WR 95-10, which defined Cal-Am's legal diversion rights and ordered a reduction in Carmel River diversions, also compels the activities currently conducted by MPWMD under its Water Allocation Mitigation Program, including erosion protection, riparian habitat enhancement and fisheries work, to be conducted by MPWMD.

3.0 POTENTIAL ENVIRONMENTAL IMPACTS

The discussion of impacts that follows is intended to address the particular environmental functions that are normally of particular concern to the Corps as a result of its role in protecting wetlands and other special aquatic sites.

3.1 Ground Water Recharge/Discharge

The Carmel River does perform a recharge function for local aquifers, which are affected by water extraction from Carmel Valley. Surface flows are regulated during the dry season by Cal-Am's Los Padres Dam. However, the dam is located upstream of the project area and will not be impacted by the proposed projects. Due to the small size of most project areas, and the location of the damage sites, impacts associated with these projects will not adversely affect groundwater recharge/discharge.

3.2 Flood Storage/Desynchronization

Several of the proposed projects may include construction of a temporary diversion structure in the Carmel River channel. As a result of the reduced size of the river channel during construction, there may be a small net increase in the amount of water that would flow around the temporary structure. Since these projects will be taking place during the summer months or early fall, flows are assumed to be minimal and therefore, flow diversions will not impact flood storage.

3.3 Sediment/Toxicant Retention

Construction will eliminate some vegetative cover at a few sites and expose areas of the on-site soils. If not protected by interim erosion control measures, these areas would be subject to erosion, increasing the sediment load in stormwater runoff. The project proponent will be required to implement erosion control measures when determined necessary. No increase in sediment or decrease in water quality is anticipated due to implementation of erosion control measure associated with site construction. Therefore, it is expected that the sediment/toxicant retention functions will not be negatively impacted by the project. In fact, the enhancement projects will improve the water quality of the Carmel River by stabilizing the bank and channel areas.

3.4 Nutrient Retention/Transformation

Many of the proposed project sites most likely perform nutrient retention/transformation roles since the project areas are located within a riparian corridor and contain riparian vegetation above and below the project site at most locations. The proposed projects could temporarily impact these functions during construction. Impacts associated with nutrient retention/transformation are considered to be minimal.

3.5 Nutrient Production/Export

The location of many of the sites within a productive riparian corridor will conceivably allow the

production of nutrients in the form of detritus and insect populations. Construction activities could temporarily impact this production through the movement of river substrate and through the removal of existing vegetation.

3.6 Aquatic Diversity/Abundance

The placement of permanent and temporary fill could reduce the local abundance of aquatic organisms during construction in and near the project sites. However, impacts will be short term and will for the most part, be temporary. It is assumed that once construction has ceased, displaced aquatic organisms will recolonize the area. Since most project sites will have little flow during construction, the proposed projects will not negatively alter the aquatic diversity or abundance of aquatic life within the project site.

3.7 Fish/Aquatic Invertebrate Habitat

The river channel flowing through the project sites provides habitat for fish and aquatic invertebrates. This habitat will be decreased for a short time during construction of proposed projects and implementation of diversion structures. Following construction, the temporary diversion structures will be removed. Impacts to fish and aquatic habitat will be short-term in nature and occur in late summer or early fall when flows are at a minimum.

3.8 Wildlife Habitat

Riparian habitats are sensitive because they have high value for wildlife and because they have declined greatly in California due to such large-scale disturbances as urbanization, stream channelization, and agricultural conversion. The riparian complex along the Carmel River represents a moderate quality native riparian complex. The riparian habitat has experienced significant on-site human disturbance from dumping, and has been narrowed by development within the floodplain. This corridor is composed of a mixture of native species and non-native species. The riparian corridor provides enough heterogeneity in both species composition and physiognomy in the study area that it still supports high wildlife diversity and habitat.

Most of the riparian habitat would be currently classified as cottonwood/willow riparian forest and riparian scrub. Willow-dominated riparian woodland habitats exists along most of the river. This habitat is very dense in several areas and is dominated by two willow species (*Salix lasiolepis*, *S.* and *S. laevigata*). Understory species include: hemlock (*Conium maculataum*), poison oak (*Toxicodendron diversilobum*), blackberry (*Rubus ursinus*), and mugwort (*Artemisia douglasiana*). Mixed riparian corridors of this type provide high value wildlife habitat for a large number of species and offer nesting sites, food, thermal cover, water, movement or migration corridors. However, many areas adjacent to the river have been developed for residential and commercial uses. Therefore, foraging areas are often limited to the riparian corridor. Cavities in the large sycamore and oak trees provide potential nesting habitat for raccoons *(Procyon lotor),* squirrels *(Sciurus griseus)* tree swallows (*Iridoprocne bicolor*), and plain tit-mouse *(Parus inornatus).* The riparian corridor along Carmel River supports fall and spring neo-tropical birds and raptors during fall and spring migrations.

Individuals of the various amphibian, reptile, bird, and small mammal species that presently occupy the specific project sites in the impacted habitat will be temporarily displaced. There will also be a net short-term loss of riparian habitat for those species preferring vegetated areas. However, all of these species will continue to use those areas outside the project vicinity. The project sites will not support an abundance and diversity of wildlife, since many project areas contain areas of particularly low habitat value to wildlife due to eroded conditions of the bank.

Adjacent river habitat is valuable to many bird species. Species of migrating waterfowl on the Pacific Flyway, as well as resident birds, use the river for feeding, resting, and possibly nesting. Some of the common plants in the riparian and streamside habitats are important natural bird and waterfowl foods. Water-related birds observed on site could include, red-winged blackbird (*Agelaius phoeniceus*), great egret (*Casmerodius albus*), killdeer (*Charadrius vociferus*), snowy egret (*Egretta thula*), great blue heron (*Ardea herodias*), black-crowned night heron (*Nycticorax nyctiocorax*), common snipe (*Capella gallinago*), mallard (*Anas platyrhynchos*), cinnamon teal (*Anas cyanoptera*) green-winged teal (*Anas carolinensis*), bufflehead *(Bucephala albeola*) and American coot (*Fulica americana*).

The riparian woodland also supports a variety of birds, mammals, and reptiles. A large diversity of birds are found in the woodland, including acorn woodpeckers (*Melanerpes formicivorus*), common flickers (*Colaptes cafer*), hummingbirds, a great variety of song birds, and raptors (predatory birds). Mammals found in woodlands of the site or in the project vicinity include black tail (coastal) deer (*Odocoileus hemionus*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), valley pocket gopher (*Thomomys bottae*), various bats, white-footed mouse (*Peromyscus leucopus*), western harvest mouse (*Reithrodontomys megalotis*), dusky-footed wood rat (*Neotoma fuscipes*), desert cottontail (*Sylvilagus audubonii*), oppossum (*Didelphis marsupialis*), and domestic dogs and cats.

The diversity of reptiles and amphibians in the riparian woodlands is typically less than the diversity of mammals and birds. Reptiles and amphibians that would be expected to occur in the woodland include: northern alligator lizard (*Gerrhonotus coeruleus*), western terrestrial garter snake (*Thamnophis elegans),* western fence lizard (*Sceloporus occidentalis*), Pacific gopher snake (*Pituophis melanoleucus catenifer),* ringneck snake (*Diadophis utrivirgata*), western skink (*Eumeces skiltonianus*), California red-legged frog (*Rana aurora draytonii*) Pacific treefrog (*Hyla regilla*), and arboreal salamander (*Aneides lugubris*).

Proposed projects may require the removal of small amounts of remaining riparian vegetation. These areas may require the removal of riparian vegetation to accommodate slope protection on severely eroded property that if left unprotected would result in an additional loss of property. Most of the adjacent areas outside the small linear riparian corridor have been highly disturbed by agriculture, development and grading activities.

3.9 Endangered Species

Proposed projects may impact habitat of two listed species, California red-legged frog (*Rana aurora draytonii*) and steelhead trout (*Oncorhynchus mykiss*).

California Red-Legged Frog (*Rana aurora draytonii*)

California red-legged frogs are listed as threatened by the U.S. Fish and Wildlife Service under the Federal Endangered Species Act, and as a Species of Special Concern by the State of California. California red-legged frogs are known to use and breed in marshy habitats, springs, both natural and artificial ponds, and slack water pools of rivers and streams. Juvenile red-legged frogs appear to have different vegetative needs than adults. Juvenile frogs normally occupy shallow water and limited shoreline or emergent vegetation. It is important to have small one meter breaks in the vegetation or clearings in the dense riparian cover to allow juveniles to sun themselves and forage, but also to have close escape from predators.

Tadpoles also have different vegetation needs. Optimal habitat for this life stage is characterized by emergent willow stems, grasses, filamentous algae, cattails and submerged weeds and stems. California red-legged frogs occur throughout the entire Central Coast hydrographic basin, as well as Ventura County south to the border of Mexico. Populations of California red-legged frogs in the Coast Ranges between Marin County and Santa Barbara are more intact than populations in the rest of the state. California red-legged frogs have been extirpated from a significant portion of their historic range. Populations of California red-legged frogs have declined due to exotic aquatic predators, habitat degradation from agricultural and grazing practices, a decrease in water quality from human manipulation of habitats, and from water diversion.

Habitat for California red-legged frogs occurs along the Carmel River. This habitat may include calm, backwater pools during the reproductive season along the lower section of the river and areas vegetated with riparian species. Therefore, habitat along the lower section of the river is considered potential California red-legged frog habitat. The habitat quality for California red-legged frogs can be degraded by the presence of predatory fish populations and predatory (non-native) bull frogs (*Rana cabastiana*).

Records show that historically, California red-legged frogs have occurred throughout most areas of the Carmel River.

Steelhead Trout (*Oncorhynchus mykiss*)

Within the south-central California coast region "Evolutionarily Significant Unit," or ESU, steelhead trout are federally listed as threatened. Steelhead trout are rainbow trout that migrate out to the ocean. In the ocean, steelhead trout are bluish-gray above with black spots on their back and fins, silver below. When steelhead are in fresh water they are often greenish and less silvery in color. Other identifying marks include a pink to red stripe on their side.

Adults spawn in stream gravel during the winter and spring. Steelhead spend the first few years of their lives in freshwater before migrating to the ocean and return to their spawning grounds as adults to breed. Unlike most other salmon species, some of the adults survive after spawning. Young may live in fresh water up to four years, then at sea for two to three years.

3.10 Consumptive Recreation

The proposed projects will most likely have no impacts on consumptive recreation.

3.11 Nonconsumptive Recreation

Project sites will most likely be used as passive recreation areas for local residents. Activities may include walking and wildlife viewing. Construction activities may result in a temporary loss of passive recreation opportunities afforded to those individuals using the areas near project sites, given that access would be limited. Also, any existing habitat values that add to the passive recreational experience may be altered, though not necessarily lost, through the placement of rip-rap in areas currently vegetated with riparian habitat.

3.12 Uniqueness/Heritage

There is a possibility that during construction of river restoration projects, subsurface concentrations of prehistoric materials could be encountered. If prehistoric archaeological materials are encountered, it is recommended that all ground-disturbing work in the immediate vicinity of the find halt until a qualified archaeologist has evaluated the situation and offered further recommendations. Prehistoric materials might include, but are not limited to, concentrations of dietary remains (such as animal bone and shell), chert, obsidian, or other stone flakes and formed artifacts, cobblestone tools or milling equipment, beads (perforated shells or stones), locally darkened friable soils (midden), or human burials. However, since proposed project sites are located along the banks of the Carmel River, which is composed of alluvial material, archeological, architectural or traditional cultural sites are not expected to occur.

3.13 Ecological Integrity/Fragmentation

Ecological integrity of the river channel and riparian habitat will be maintained throughout construction. Material utilized in the construction of the temporary coffer dam will be removed after construction.

4.0 REFERENCES

Monterey County Water Resources Agency, Carmel River Emergency Channel and Levee Repair Application. August 10, 1995

Monterey Peninsula Water Management District, Carmel River Management Plan, April 1984.

Monterey Peninsula Water Management District, Water Allocation Program, Five-Year Mitigation Program for Option V - 16,700 AF Cal-Am Production, November, 1990.

Monterey Peninsula Water Management District, Ten Year Review of the Carmel River Management Program, April 1993.

Monterey Peninsula Water Management District, Final Implementation Plan for Mitigation Program, Fiscal Years 1997-2001, October 1996.

Monterey Peninsula Water Management District, Notification Package for Department of the Army Regional General Permit, Carmel River Repair Project ,August 1998.

U.S. Army Corps of Engineers, San Francisco District, Department of the Army Permit No. 21793S09, issued to the Monterey County Water Resources Agency for emergency repairs to the banks, levees and channel of the Carmel River, October 5, 1995.

U.S. Army Corps of Engineers, San Francisco District, Department of the Army Regional General Permit No. 23081 for Immediate Repairs of Public Facilities Damaged During Winter Storms Permit, File No. 23783S, authorization issued to the Monterey Peninsula Water Management District for streambank repairs at 23 sites along the Carmel River, September 15, 1998.

ATTACHMENTS

Figure 1 – Watershed Location Map

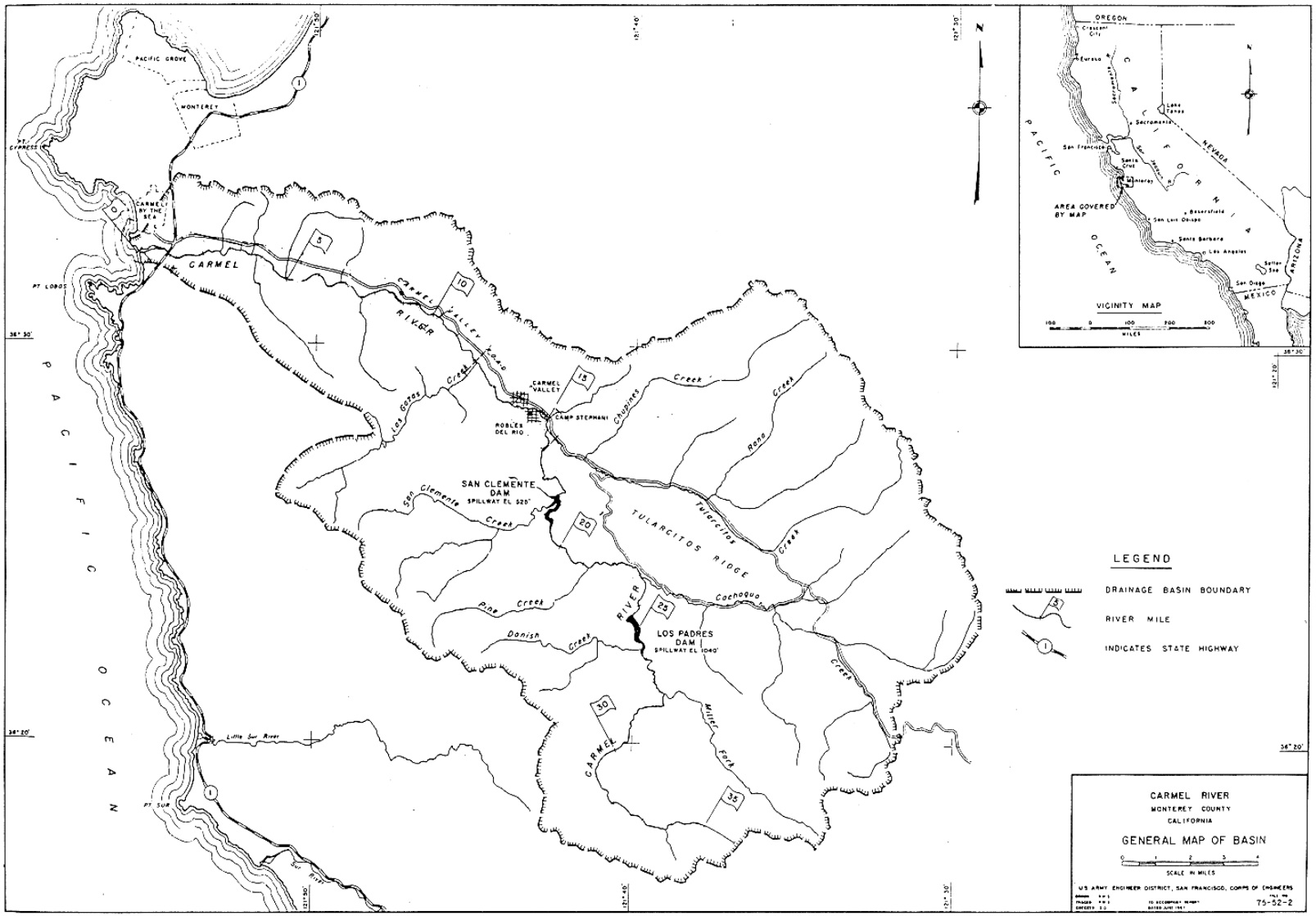


Figure 2 – Carmel River Location Maps

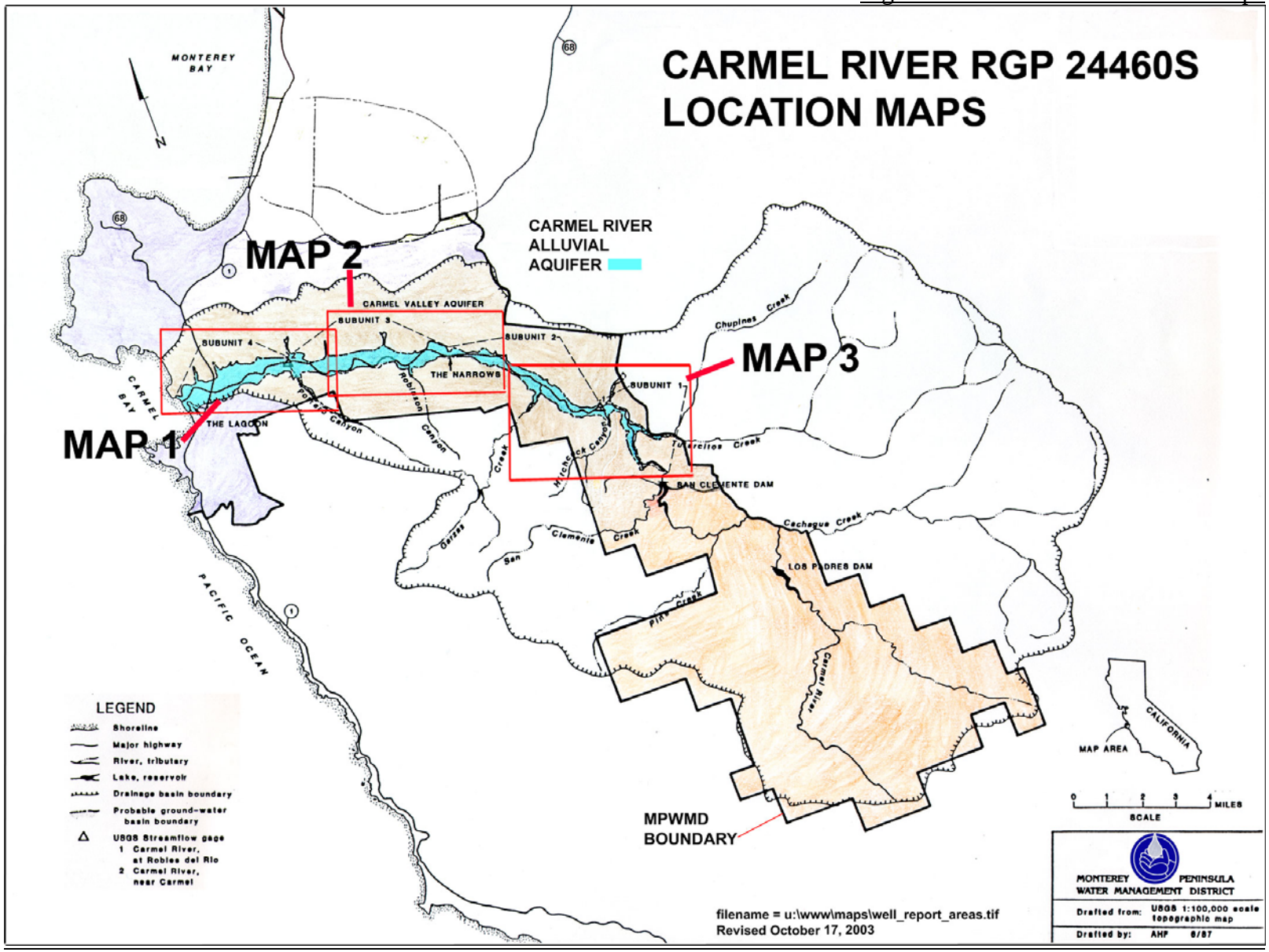
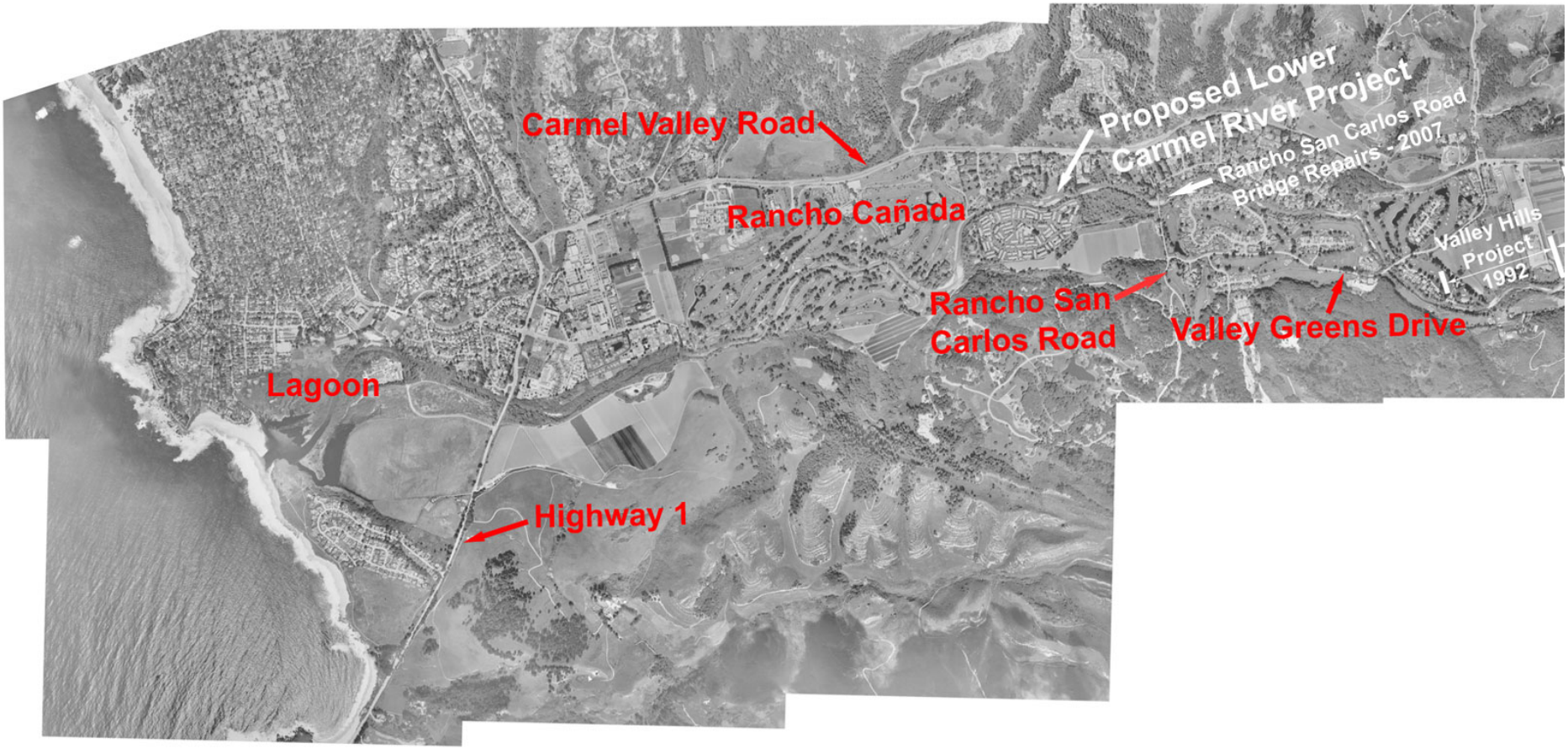
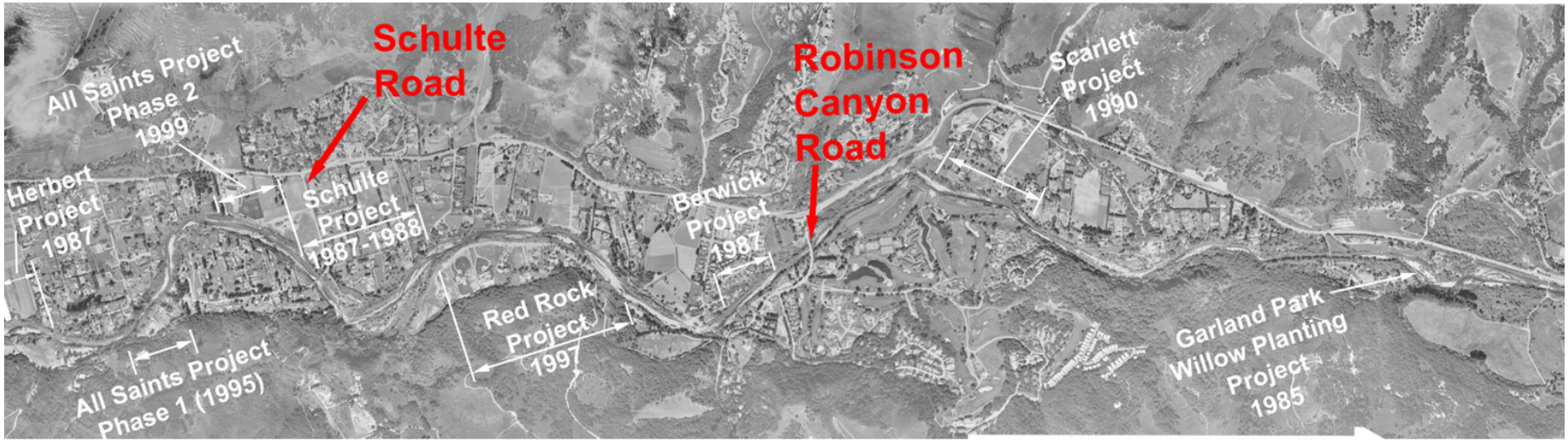


Figure 2a – Carmel River Location Maps



Carmel River RGP 24460S - 1 of 3

Figure 2b – Carmel River Location Maps



Carmel River RGP 24460S - 2 of 3

Figure 2c – Carmel River Location Maps

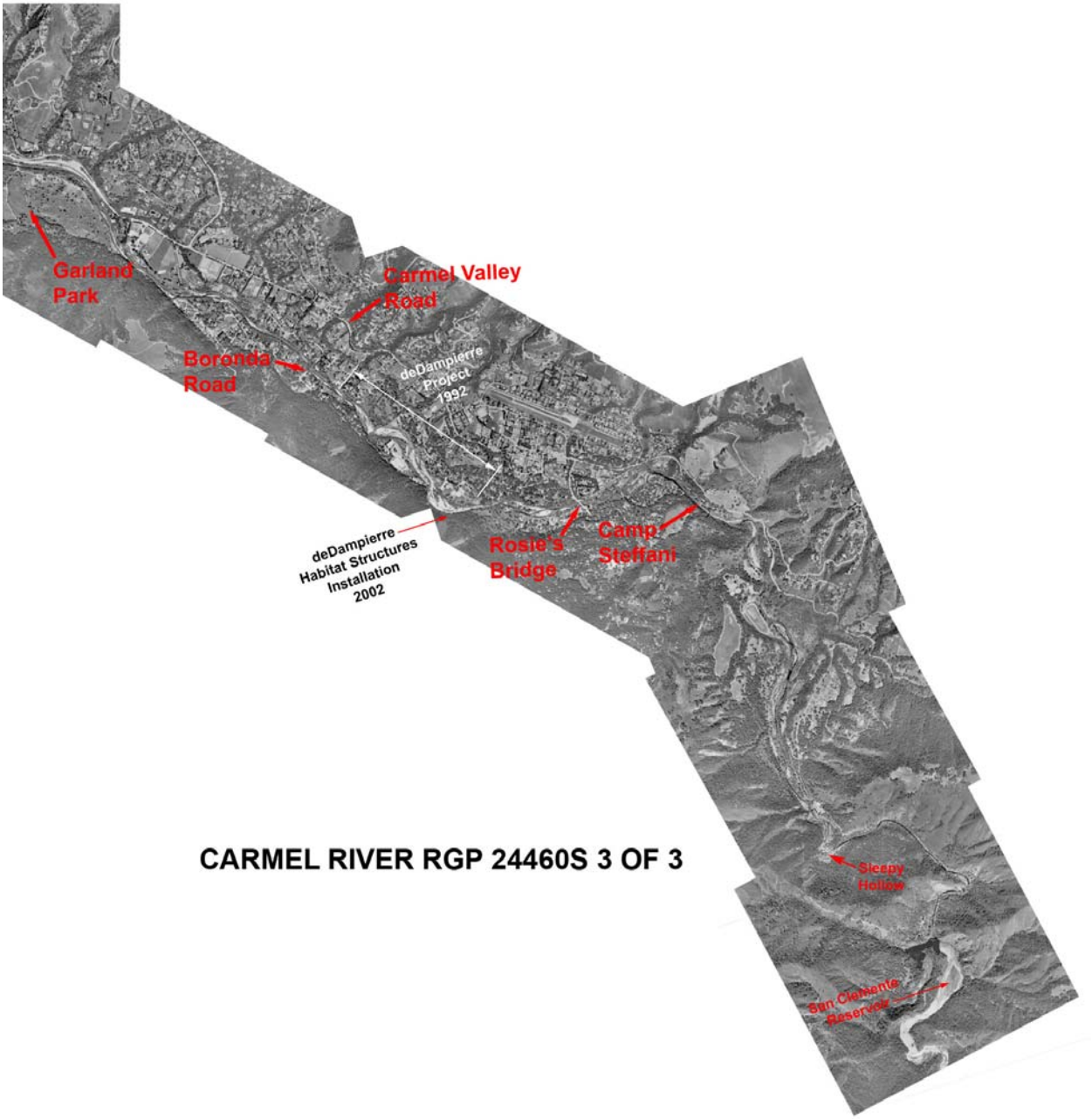


Table 1. Applicability of the 21 Public Interest Factors listed in 33 CFR 325.3 (c) (1) to the Carmel River Management Program.

Public Interest Factor	**Project Impact**
1. Conservation	Conservation concerns include the minimization of impacts to wildlife species and habitat. Proposed river restoration and riparian habitat enhancement projects would improve degraded river channel and bank vegetation conditions, providing better habitat for wildlife species. Therefore, river restoration projects are expected to have significant beneficial effects on wildlife species and their habitat. Adverse impacts associated with project implementation would be temporary and undertaken during periods of low flow. Equipment mobilization will be minimized by restricting and limiting routes to pre-existing access points, or unvegetated areas within the project boundary. No special status species are expected to be adversely impacted.
2. Economics	Through implementation of MPWMD's projects, it is anticipated that erosion will be minimized in recreational, agricultural, commercial and residential areas. District projects would reduce the loss of property normally associated with bank failure. Through enhancement of fisheries and riparian habitat, outdoor recreation and tourism may increase. The minimization of erosion and increase in tourism will produce a beneficial effect on economics in the area by maintaining property values, reducing crop losses, reducing the need for public works and other personnel to respond to erosion events, and by increasing revenue of local business owners from tourism.
3. Aesthetics	Some construction activities required to implement projects may result in temporary adverse impacts to the area's aesthetic quality; however, projects implemented by MPWMD will result in an overall beneficial impact through restoration and revegetation efforts to return the Carmel River to a more natural environment.

Table 1. Applicability of the 21 Public Interest Factors listed in 33 CFR 325.3 (c) (1) to the Carmel River Management Program.	
4. General environmental concerns	Environmental concerns include the minimization of disturbance to wildlife species and habitat during construction, specifically impacts to steelhead and/or California red-legged frogs. Minor impacts to wetlands may occur if wetlands are present along the river channel. It is anticipated that affected wetlands will naturally regenerate after project implementation. Significant beneficial impacts to wildlife and wildlife habitat are expected as a result of the proposed project. River bank stabilization will reduce the amount of fine sediment and generally increase channel stability.
5. Wetlands	Wetland vegetation that forms in shallow ponds and along slow moving portions of river could be temporarily or permanently impacted during implementation of District projects. Dominant species include cattails, bulrushes, rushes, and sedges and other woody vegetation. Willows may be removed from central portions of the channel to restore channel geometry and prevent bank erosion during high flows. It is anticipated that wetlands impacted by these projects would reestablish in the impact area.
6. Historic properties	No historic properties have been identified in the project area.
7. Fish and wildlife values	No net loss of fish or wildlife habitat is anticipated by project construction. A net beneficial gain in habitat is expected. Project impacts affecting fish and wildlife use include the temporary loss of habitat and minor increases in turbidity and sedimentation during construction. However, since work would be done during low flow periods, construction activities are not expected to have significant impacts on wildlife or wildlife habitat. Most of the area's wildlife species are mobile and can avoid construction activities. Special-status species that could be impacted to some degree are the steelhead and the California red-legged frog. Both species are discussed in Section 3.9.

Table 1. Applicability of the 21 Public Interest Factors listed in 33 CFR 325.3 (c) (1) to the Carmel River Management Program.	
8. Flood hazards	Flooding has occurred along the 18.6 mile project reach of the Carmel River in past years. The proposed project purpose is to minimize potential erosion by stabilizing channel banks, revegetating with riparian species and enhancing streamside habitat. While this will not alleviate flooding, it will improve flows through those reaches where erosion hazards have been addressed.
9. Floodplain values	A significant portion of the Carmel River 100-year and 500-year floodplain was converted to mixed-used development during the 20th century. Implementation of the proposed projects would not have an impact on floodplain values, although some terrace areas should benefit from revegetation with native riparian species.
10. Land use	Proposed projects would not affect current land use. Remaining riparian areas near the Carmel River are protected by ordinance and rules limiting the type of activities that can be carried out. Streamside areas would remain as open space and wildlife habitat after project implementation.
11. Navigation	Proposed projects would not have an impact on navigation, since work would be done during the low flow periods.
12. Shoreline erosion and accretion	There are no coastal or reservoir projects proposed within the project reach. However, streambank stabilization could influence the rate of supply of sediment at the Carmel River State Beach. The net effect is uncertain, as one result from stabilizing streambanks with vegetation is that the river channel tends to narrow over time with vegetation encroachment, which increases the sediment transport capacity.
13. Recreation	Projects implemented by MPWMD should enhance the natural resources of the Carmel River and may attract more recreational use (e.g., hiking, bathing, boating, fishing).
14. Water supply and conservation	District projects will not adversely impact water supply or conservation measures currently in place. Proposed projects may provide beneficial impacts by protecting streambanks near municipal supply wells.

Table 1. Applicability of the 21 Public Interest Factors listed in 33 CFR 325.3 (c) (1) to the Carmel River Management Program.	
15. Water quality	Impacts to water quality include temporary and minor increases in sedimentation and turbidity during implementation of proposed project. These impacts will be minimized by implementing projects during the low flow periods and installing erosion protection measures (silt stop fencing, etc).
16. Energy needs	The proposed project is not expected to affect public energy needs.
17. Safety	Proposed projects would minimize bank erosion, which can create a health and safety hazard during high flows. The proposed project will have a beneficial impact on public safety.
18. Food and fiber production	Streambank stabilization projects in the vicinity of agricultural lands would protect those lands from loss due to bank erosion.
19. Mineral needs	Gravel mining operations are prohibited along the Carmel River.
20. Property ownership	The project would have no effect on property ownership.
21. General needs and welfare of the people	The proposed project is necessary to meet the safety needs of the public and minimize health and safety hazards and property damage caused by high flow events on the Carmel River.

Table 2 Project Impact Summary	
Project Type	Activity
Fish Habitat Enhancement	<u>Fill</u> • placement of log/boulder groups along toe of bank; • stockpiling of gravel material in channel; • replacement of gravel material on the bottom of completed channel projects; • placement of temporary fill for flow diversion; • placement of fill for temporary access road. <u>Excavation</u> • excavation of meandering low-flow channel; • excavation of pool/riffle sequence;
Riparian Habitat Restoration	<u>Fill</u> • placement of topsoil on bank area; • fill associated with the mechanical removal and relocation of trees below OHW mark; • fill associated with installation of willow vegetation below OHW mark. • fill associated with installation of rip rap to maintain bank stability <u>Excavation</u> • grading or contouring of the bank; • trenching required for irrigation line; • excavation of planting holes and trenches for trees and irrigation lines.
Bank Stabilization	<u>Fill</u> • placement of log/boulder groups along toe of bank; • stockpiling of gravel material in channel; • placement of bank stabilization material (rip-rap); • placement of backfill material on banks; • placement of temporary fill for flow diversion; • placement of fill for temporary access road; • placement of topsoil on bank area; • fill associated with the mechanical removal and relocation of trees below OHW mark; • replacement of cobble armor layer. <u>Excavation</u> • grading or contouring of the bank; • trenching at toe of bank for stabilization material; • excavation of planting holes and trenches for trees and irrigation lines; • excavation of low-flow channel;

Table 2 Project Impact Summary	
Project Type	Activity
Channel Restoration	<u>Fill</u> • stockpiling of gravel material in channel; • placement of gravel material and cobble layer on the bottom of completed channel projects; • placement of temporary fill for flow diversion; • placement of fill for temporary access road. <u>Excavation</u> • excavation of channel material; • excavation of gravel bars.
Vegetation and Debris Maintenance	<u>Fill</u> • fill associated with the mechanical removal and relocation of trees below OHW mark. <u>Excavation</u> • excavation of debris such as trees and garbage.

Table 3 Recommended Number of Juvenile Steelhead in 5-, 125-, and 400-gallon Containers, at Loading Densities Ranging from 0.01 to 0.1 Kg/Kg.

			NUMBER OF FISH PER CONTAINER								
			5-Gallon Bucket			125-Gallon Tank			400-Gallon Tank		
Forklength (mm)	Forklength (in)	Weight (gm)	Loading Density 0.01	Loading Density 0.05	Loading Density 0.1	Loading Density 0.01	Loading Density 0.05	Loading Density 0.1	Loading Density 0.01	Loading Density 0.05	Loading Density 0.1
50	2.0	1.4	99	493	987	3,084	15,418	30,838	9,869	49,337	98,675
55	2.2	1.8	74	369	737	2,304	11,517	23,037	7,372	36,856	73,713
60	2.4	2.4	56	282	565	1,765	8,825	17,652	5,649	28,241	56,482
65	2.6	3.1	44	221	442	1,382	6,908	13,817	4,422	22,106	44,212
70	2.8	3.9	35	176	352	1,101	5,506	11,014	3,525	17,621	35,242
75	3.0	4.8	28	143	285	892	4,458	8,918	2,854	14,267	28,534
80	3.1	5.8	23	117	234	732	3,659	7,320	2,342	11,710	23,421
85	3.3	7.0	19	97	195	608	3,040	6,080	1,946	9,727	19,455
90	3.5	8.3	16	82	163	510	2,552	5,105	1,634	8,167	16,333
95	3.7	9.8	14	69	138	433	2,163	4,326	1,384	6,921	13,843
100	3.9	11.5	12	59	118	370	1,849	3,698	1,183	5,916	11,832
105	4.1	13.4	10	51	102	318	1,592	3,185	1,019	5,095	10,191
110	4.3	15.4	9	44	88	276	1,381	2,762	884	4,419	8,839
115	4.5	17.7	8	39	77	241	1,205	2,411	772	3,857	7,715
120	4.7	20.1	7	34	68	212	1,058	2,117	677	3,386	6,773
125	4.9	22.8	6	30	60	187	934	1,868	598	2,989	5,977
130	5.1	25.7	5	27	53	166	828	1,657	530	2,651	5,301
135	5.3	28.8	5	24	47	148	738	1,476	472	2,362	4,723
140	5.5	32.2	4	21	42	132	660	1,321	423	2,113	4,226
145	5.7	35.9	4	19	38	119	593	1,186	380	1,898	3,796
150	5.9	39.8	3	17	34	107	535	1,069	342	1,711	3,421
155	6.1	44.0	3	15	31	97	484	967	310	1,547	3,095
160	6.3	48.5	3	14	28	88	439	878	281	1,404	2,808
165	6.5	53.3	3	13	26	80	399	799	256	1,278	2,556
170	6.7	58.4	2	12	23	73	364	729	233	1,166	2,333
175	6.9	63.8	2	11	21	67	334	667	214	1,067	2,135
180	7.1	69.5	2	10	20	61	306	612	196	979	1,958
185	7.3	75.6	2	9	18	56	281	563	180	900	1,801
190	7.5	82.0	2	8	17	52	259	519	166	830	1,660
195	7.7	88.8	2	8	15	48	240	479	153	767	1,533
200	7.9	96.0	1	7	14	44	222	443	142	709	1,419
205	8.1	103.5	1	7	13	41	206	411	132	658	1,315
210	8.3	111.4	1	6	12	38	191	382	122	611	1,222
215	8.5	119.8	1	6	11	36	178	355	114	569	1,137
220	8.7	128.5	1	5	11	33	166	331	106	530	1,060
225	8.9	137.6	1	5	10	31	155	309	99	495	989
230	9.1	147.2	1	5	9	29	145	289	93	463	925
235	9.3	157.2	1	4	9	27	135	271	87	433	866
240	9.4	167.7	1	4	8	25	127	254	81	406	812
245	9.6	178.6	1	4	8	24	119	238	76	381	762
250	9.8	190.0	1	4	7	22	112	224	72	358	717
255	10.0	201.9	1	3	7	21	105	211	67	337	675
260	10.2	214.2	1	3	6	20	99	199	64	318	636
265	10.4	227.1	1	3	6	19	94	187	60	300	600
270	10.6	240.5	1	3	6	18	88	177	57	283	566
275	10.8	254.3	1	3	5	17	84	167	54	268	535
280	11.0	268.8	1	3	5	16	79	158	51	253	507
285	11.2	283.7	0	2	5	15	75	150	48	240	480
290	11.4	299.2	0	2	5	14	71	142	46	228	455
295	11.6	315.3	0	2	4	13	67	135	43	216	432
300	11.8	331.9	0	2	4	13	64	128	41	205	410

Table 4

MPWMD California Red-legged Frog Habitat Assessment/Carmel River

SITE/RIVER MILE: GPS WAYPOINT: DATA COLLECTOR:

DATE: Time and Weather:

LIMITING FACTORS FOR CALIFORNIA RED-LEGGED FROGS AT DIFFERENT LIFE HISTORY STAGES

Habitat Characteristics	**Egg and Tadpole**			**Young-of-Year or Juvenile** (Tail-stub or SNVL 4 cm)			**Adult (Resident)**			**Adult (Temporary Hydration)**		
Seasonality of water (in a normal rainfall year)	Water depth < 20 cm (8 in) and dry before July 1			Water dry before July 1			Water dry before July					
Flushing Flows (moving water strong enough to scour eggs or tadpoles)	Flushing flows during or after the month of March			Flushing flows or areas without slow moving water after the month of June								
Water Salinity (coastal lagoon environments)	Greater (>) 4.0 ppt by April, > 6.5 ppt by the end of June. (>7.5 ppt by August only if tadpoles still present)			>7.5 ppt year round or between March and September			>9.0 ppt year round or between March and September			Temporary water sources with surface salinity >9.0 ppt		
Water Temperature	Above 25 C			Above 29 C			Above 29 C			Above 29 C		
Other (**Explain)**	_____			_____			_____					
LIMITING FACTOR	Egg and Tadpoles			**Young-of-Year/Juv**			**Resident Adult**			**Temporary Adult**		

NOTES:

REFERENCES:

Reis, Dawn, K. 1999. Habitat characteristics of California red-legged frog (*Rana aurora draytonii*): Ecological Differences between eggs, tadpoles and adults in a coastal brackish and freshwater system. Masters Thesis. San Jose State University, San Jose, CA.

Table 4

SITE/RIVER MILE:

DATE:

HABITAT QUALITY FOR CALIFORNIA RED-LEGGED FROGS AT DIFFERENT LIFE HISTORY STAGES CIRCLE IF PRESENT and TALLY COLUMNS				
Habitat Characteristic	**Egg and Tadpole** Circle items in column if present between Jan-Jul	**Young-of-Year or Juvenile** (Tail-stub or SNVL 4 cm) Circle items in column if present between Jul-Sept	**Adult (Resident)** Circle items in column if present between all year	**Adult (Temporary Hydration)** Circle items in column if present seasonally
Water depth	Shallow water depth (0.2m to 0.5m)	Both shallow and moderate depth (0.2 m to 1 m)	Deep water (> 1m) perennially	Deep water (> 1m) Seasonally
Predators (1)	No adult bullfrogs	No adult bullfrogs	No adult bullfrogs	No or few adult bullfrogs
Predators (2)	No bullfrog reproduction	No bullfrog reproduction	No bullfrog reproduction	No bullfrog reproduction
Predators (3)	No fish or crayfish	No fish or crayfish	No fish or crayfish	No or few or crayfish
Cover (1) Aquatic vegetation	Presence of **sub**mergent (rooted aquatic plants) especially high oxygenating plants (e.g. *Potamogeton*. sp.)	**Low** to **moderate** cover of **e**mergent vegetation and/or **moderate** to **high sub**mergent vegetation.	**Moderate** cover of **e**mergent vegetation and/or **moderate** to **high sub**mergent vegetation.	**Moderate** cover of **e**mergent vegetation and/or **moderate** to **high sub**mergent vegetation.
Cover (2)	Deep mud substrate or benthic algae for cover	Deep mud substrate or algae mats for cover	Deep mud substrate or algae mats for cover	Deep mud substrate or algae mats for cover
Cover (4) Upland cover near water's edge	N/A	Under-cut bank, dense veg., or wood (logs, tree roots with craw space for frogs)	Under-cut bank, dense veg., or wood (logs, tree roots with craw space for frogs)	Under-cut bank, dense veg., or wood (logs, tree roots with craw space for frogs)
Other (Explain)				
Ranking: 1 to 2 = low 3 to 4 = moderate over 5 = excellent	Numbered Circled_____ 1 to 2 = low 3 to 4 = moderate over 5 = excellent	Numbered Circled_____ 1 to 2 = low 3 to 4 = moderate over 5 = excellent	Number Circled _____ 1 to 2 = low 3 to 4 = moderate over 5 = excellent	Number Circled_____ 1 to 2 = low 3 to 4 = moderate over 5 = excellent

Table 4

SITE/RIVER MILE: **Page 3 of 3**

DATE:

DESCRIPTIVE INFORMATION

# CRLF Observed focused surveys conducted? **Y N**	Eggmass:_____ Tadpoles: _____ Young-of Year: _____ Juvenile: _____ Adult _____
Other Amphibians	**Circle if present** Bullfrog adult juvenile tadpole eggs Tree frog adult juvenile tadpole eggs Western toad adult juvenile tadpole eggs Other _____adult juvenile tadpole eggs
Aquatic Habitat Type	**Circle**: Pond Year-round Seasonal Size_____ River-main stem Year-round Seasonal Size_____ Tributary/Creek Year-round Seasonal Size_____ Off channel pocket pool Year-round Seasonal Size_____ Other _____ Year-round Seasonal Size_____
Aquatic Habitat Features	Aquatic Substrate_____ Submergent species and % cover _____ Emergent species and % cover _____
Upland Habitat	Habitat type/species from water's edged to 500 ft._____ Circle if present: leaf litter mammal burrow woody debris
Water Quality Velocity/Temp	Time Depth (m) Temp (c) Gage (if present) (surface)0.0m _____ Flow 0.25m _____Bottom Depth (m) _____ _____

PHOTOS:

OTHER NOTES:

Exhibit 1

CARMEL RIVER MILEAGE SURVEY

MPWMD MONITOR WELLS	Feet Upstream	Miles	Kilometers
State Parks - Beach (Multiple)	370	0.07	0.11
State Parks - Wetlands (Multiple)	1,637	0.31	0.50
CAWD Observation	3,432	0.65	1.05
Odello West - Near CAWD (Multiple)	3,802	0.72	1.16
CAWD - Rio Road (Multiple)	8,712	1.65	2.66
Clark	9,187	1.74	2.80
Rancho Canada West	11,246	2.13	3.43
Druid Hills Ranch	16,421	3.11	5.01
Rancho Canada East - (Multiple)	16,500	3.13	5.03
Via Mallorca	17,150	3.25	5.23
Rubin	18,780	3.56	5.72
San Carlos- (Multiple)	19,350	3.66	5.90
Oppenheimer	19,900	3.77	6.07
Brookdale	20,350	3.85	6.20
Piezometer	20,330	3.85	6.20
Valley Greens	20,400	3.86	6.22
Sweeney (Okazaki)	21,380	4.05	6.52
Lake Place	24,700	4.68	7.53
Cypress	28,580	5.41	8.71
Williams North	28,723	5.44	8.75
Williams South	29,430	5.57	8.97
Vetter	29,800	5.64	9.08
Pearce- (Multiple)	30,000	5.68	9.14
Bernardi	30,500	5.78	9.30
Worth (Templeman)	31,050	5.88	9.46
Brown	31,550	5.98	9.62
Frumkin	31,880	6.04	9.72
Schulte	34,500	6.53	10.52
Carmel Valley High School	35,376	6.70	10.78
Reimers #1	35,482	6.72	10.81
Mandelman	38,700	7.33	11.80
Dick	39,430	7.47	12.02
Center Road	42,330	8.02	12.90
Mid-valley	42,330	8.02	12.90
Carmel Valley Ranch #8	44,774	8.48	13.65
Carmel Valley Ranch #5	44,880	8.50	13.68
Coyote u.s.	46,781	8.86	14.26
Carmel Valley Ranch #1	47,203	8.94	14.39
Hernstadt	57,400	10.87	17.50
Kurtz- 2	58,880	11.15	17.95
Boronda	66,130	12.52	20.16
Little League #1	72,072	13.65	21.97
Paso Hondo	73,530	13.93	22.41
Village Road	74,300	14.07	22.65
Via Helechos	75,400	14.28	22.98

CARMEL RIVER MILEAGE SURVEY

	Feet Upstream	Miles	Kilometers
BRIDGES			
Highway 1	5,780	1.09	1.76
R.C. Golf Cart Bridge #5	11,230	2.13	3.42
R.C. Golf Cart Bridge #4	12,530	2.37	3.82
R.C. Golf Cart Bridge #3	13,450	2.55	4.10
R.C. Golf Cart Bridge #2	14,030	2.66	4.28
R.C. Golf Cart Bridge #1	14,780	2.80	4.50
Via Mallorca	17,110	3.24	5.21
San Carlos	20,380	3.86	6.21
Valley Greens	25,460	4.82	7.76
C.V.G.C.C. Golf Cart Bridge	27,430	5.20	8.36
Schulte	35,360	6.70	10.78
Robinson Canyon	44,680	8.46	13.62
Randazzo	53,470	10.13	16.30
Don Juan	56,940	10.78	17.36
Boronda.	66,980	12.69	20.42
Esquiline	76,290	14.45	23.25
Stonepine	83,330	15.78	25.40
CREEKS			
Hatton	7,640	1.45	2.33
Potrero	20,510	3.88	6.25
Robinson Canyon	42,800	8.11	13.05
Berwick Canyon	42,950	8.13	13.09
Buckeye	44,750	8.48	13.64
Coyote Gulch	48,080	9.11	14.65
Don Juan	57,580	10.91	17.55
Miramonte	58,760	11.13	17.91
Las Garzas	65,910	12.48	20.09
Hitchcock	76,950	14.57	23.45
Klondike Creek	81,430	15.42	24.82
Tularcitos	83,710	15.85	25.51

CARMEL RIVER MILEAGE SURVEY

	Feet Upstream	Miles	Kilometers
CAL-AM PRODUCTION WELLS			
Rancho Canada	16,500	3.13	5.03
San Carlos	19,500	3.69	5.94
Cypress	28,580	5.41	8.71
Pearce	30,000	5.68	9.14
Schulte	34,300	6.50	10.45
Manor	37,750	7.15	11.51
Begonia	41,030	7.77	12.51
Berwick #7	42,600	8.07	12.98
Berwick #8	43,400	8.22	13.23
Scarlett #6	48,040	9.10	14.64
Stanton (decommissioned)	50,660	9.59	15.44
Los Laureles #6	57,750	10.94	17.60
Los Laureles #5	58,800	11.14	17.92
West Garzas	63,960	12.11	19.50
Garzas Creek	66,080	12.52	20.14
Panetta	68,210	12.92	20.79
Robles	76,290	14.45	23.25
Russell #4	85,550	16.20	26.08
Russell #2	85,800	16.25	26.15
MISCELLANEOUS			
CAWD Ocean Outfall Pipeline	3,550	0.67	1.08
USGS - Near Carmel	17,110	3.24	5.22
USGS - Robles Del Rio	76,200	14.43	23.23
Sleepy Hollow Weir	93,150	17.64	28.39
Old Carmel Dam	96,460	18.27	29.40
San Clemente Dam	98,270	18.61	29.95
Los Padres Dam	130,940	24.80	39.91

Notes:

(1) Measurements for this survey were taken off of aerial photos taken in June 1986. The original photos were flown at a scale of 1:6000. The photos were enlarged by Towill, Inc. to a scale of 1:1200 (i.e., 1" = 100'). A centerline of the river was drawn by District staff from a baseline at the mouth of the Carmel River to approximately 1.5 miles above San Clemente Dam. Measurements were made on the south side of the line noting both miles and kilometers. Incremental measurement marks were made every 200 feet on the south side of the line and at every tenth of a kilometer on the north side of the line. Measurements for specific sites were rounded to the nearest ten feet before conversion. Conversion factors: a) 1 mile = 5,280 feet; b) 1 Kilometer = 3,281 feet.

(2) The measurement for Los Padres Dam, 24.8 miles, was taken from the Feasibility Report on Wate*r Resources Development in the Carmel River, Monterey County, California* , prepared by the U.S. Army Corps of Engineers in May 1981. Specifically, Volume II, Appendix C, *Hydrology and Hydraulics Analysis* , Section III, *Present Condition Surface Water Hydrology* , Subsection B, *Existing Water Resources Development* , page C-2.

Source: Original by LS 8/88; revised by DHD 2/2000 and TLL 3/2000, edited by DWF 12/10/2002 and 3/5/2003.

AP NO	MP NO	OWNER	ADDRESS	CITY
157-151-002	0	Tom & Susan Chipman	3442 Mountain Springs Road	Lafayette, CA 94549
169-151-024	00	Keith & Eileen Crist	P.O. Box 221118	Carmel CA 93922
009-481-004	001	Calif. Dept. Parks & Rec./Attn.Ken Gray	2211 Garden Road	Monterey, CA 93940
009-491-001	002	Calif. Dept. Parks & Rec.-Attn. Ken Gray	2211 Garden Road	Monterey, CA 93940
009-511-009	003	Calif. Dept. Parks & Rec.-Attn. Ken Gray	2211 Garden Road	Monterey, CA 93940
243-021-007	004	Calif. Dept.Parks & Rec.-Attn. Ken Gray	2211 Garden Road	Monterey, CA 93940
009-511-011		Homestead INN, LLC	2049 Century Park E. Suite 2500	Los Angeles, CA 90067
*009-511-010	006	Carmel Area Wastewater Dist. Attn: S. Veile	PO Box 221428	Carmel CA 93922
009-521-002	007	City of Carmel City Administrator	P.O. Box CC	Carmel, CA 93921
*009-521-004	008	Carmel Area Wastewater Dist. Attn: S. Veile	P.O. Box 221428	Carmel CA 93922
009-541-025	009	Carmel Area Wastewater District Attn: S. Veile	P.O. Box 221428	Carmel CA 93922
009-541-021		Roman Catholic Bishop	PO Box 2048	Monterey, CA 93942
009-563-005	011	IWF Carmel River Innvestors Attn: Vice President of Acquisitions	2905 Burton Dr.	Cambria, CA 93428
243-071-003, 004, 006	014	Clinton and Margaret Eastwood c/o Kaufman & Bernstein	2049 Century Park E. Suite 2500	Los Angeles, CA 90067
243-071-005	014B	Big Sur Land Trust	PO Box 221864	Carmel, CA 93922
009-562-036		Carmel Valley Partners	15350 SW Sequoia Pkwy STE 300	Portland, OR 97224
009-562-034	015A	Carmel Valley Partners	15350 SW Sequoia Pkwy STE 300	Portland, OR 97224
*009-562-032	016	Carmel Properties Company	P.O. Box 221368	Carmel CA 93922
015-532-045	017	Arroyo Carmel Homeowners Association	3850 Rio Road	Carmel CA 93923
015-531-051	018	Arroyo Carmel Homeowners Association	3850 Rio Road	Carmel CA 93923
015-541-044	019	Riverwood Community Assoc.	4000 Rio Road	Carmel CA 93923
015-541-091		Riverwood Community Assoc.	4000 Rio Road	Carmel CA 93923
015-021-007	021	Andrew Spranza	4068 Rio Rd.	Carmel, CA 93923
015-021-006	022	Towle Family Trust	P.O. Box 223102	Carmel CA 93922
015-021-029	023	Property Reserve Inc	50E North Temple #22	Salt Lake City UT 84150
157-121-001	024	Monterey Peninsula Regional Park District	60 Garden Ct.	Monterey, CA 93940
015-162-039		Lombardo Land Group I LP	PO Box 22590	Carmel CA 93922
015-162-009	026	Susan Hoag	190 Calera Canyon Rd	Salinas, CA 93908
015-162-037	027	Howard Hatton Ltd. Partnership c/o Rancho Canada Golf Club	PO Box 22590	Carmel CA 93922
015-162-038	027A	California-American Water Co.	P.O. Box 5600	Cherry Hill, NJ 08034
157-181-004	028	Lombardo Land Group II LP	PO Box 22590	Carmel CA 93922
157-181-003	029	Heritage Development LP ET AL c/o Jeffrey & Paula Taylor	208 Corral De Tierra	Salinas CA 93908
*157-121-020		Quail Lodge Inc.	8000 Valley Greens Drive	Carmel Valley CA 93924
*157-121-017	030	Quail Lodge Inc.	8000 Valley Greens Drive	Carmel Valley CA 93924
015-162-020	031	Hacienda Carmel Community Assoc.	1000 Hacienda Carmel	Carmel CA 93923
015-281-010	032	Roy and Donna Woods	P.O. Box 648	Monterey Ca 93942
015-281-009	033	Nick Jr. & Gerda Marotta	P.O. Box 22380	Carmel CA 93922
015-281-007	034	Marlene Martin	26455 Via Mallorca	Carmel CA 93923
015-271-010		E. Wesley & Marilyn Lewis	26470 Via Petra	Carmel CA 93923
015-341-001	036	Hacienda Carmel Community Assoc.	1000 Hacienda Carmel	Carmel CA 93923
015-271-009	037	Abdol & Mary Sotoodeh	P.O.Box 223193	Carmel, CA 93922
015-271-008	038	Delma Stone	26485 Via Petra	Carmel CA 93923
015-271-007	039	John & Martha Kenny	P.O. Box 1481	Carmel CA 93921
015-251-023		Amelia A. Dow	480 Larson Court	Marina CA 93933
015-251-024	041	Amelia A. Dow	480 Larson Court	Marina CA 93933
015-251-037	042	Thomas & Wendy Duffy	5700 Carmel Valley Road	Carmel, CA 93923
015-251-038	043	Thomas & Donna Horsley	5710 Carmel Valley Road	Carmel CA 93923
015-331-001	044	Hacienda Carmel Community Assoc.	1000 Hacienda Carmel	Carmel CA 93923
015-251-039		Monterey Peninsula Jewish Comm. Inc.	5716 Carmel Valley Road	Carmel CA 93923
015-251-012	046	Robert Fenton & Debra Givner	5790 Carmel Valley Road	Carmel CA 93923
015-251-013	047	Peggy L. Wenner	5800 Carmel Valley Road	Carmel, CA 93923
015-251-030	048	Cal-Am Water Company	P.O. Box 5600	Cherry Hill, NJ 08034
015-251-014	049	Hacienda Carmel Comm Assoc	1000 Hacienda Carmel	Carmel CA 93923
015-251-032		Anthony Villafranca	560 E Alisal St.	Salinas CA 93905
015-251-041	051	Laura Pasten	26580 Rancho San Carlos	Carmel CA 93923
015-251-043	051A	Chase Home Finance LCC	3415 Vision Drive	Columbus OH 43219
015-251-028	052	Florence E. Miller Trust	26620 Rancho San Carlos	Carmel CA 93923
015-251-027	053	Nicole Asselborn & James Lake	P.O Box 222577	Carmel CA 93922
157-121-006	054	Quail Lodge Inc	8205 Valley Greens Rd	Carmel Ca 93923
015-251-010		Rancho San Carlos Partnership	3727 Buchanan St. Fl 4	San Francisco, CA 94123
157-121-006	056	Quail Lodge, Inc.	8205 Valley Greens Rd	Carmel CA 93923
015-241-001	057	Michael & Nancy Yee	5970 Brookdale Drive	Carmel CA 93923
015-241-002	058	David Keaton/Thomas Keaton Trust	6000 Brookdale Drive	Carmel CA 93923
015-241-003	059	David Keaton/Thomas Keaton Trust	6000 Brookdale Drive	Carmel CA 93923
015-241-004		James & Charlotte Sheldon	6060 Brookdale Drive	Carmel CA 93923
015-241-012	061	Vince and Julia Hunt	6090 Brookdale Drive	Carmel CA 93923
015-241-013	062	Shirin Riazi C/O Creative Property Management	1220 Del Monte Avenue	Monterey CA 93940
015-241-007	063	John A. & Sabina DeWit	6150 Brookdale Drive	Carmel CA 93923
015-241-008	064	Terence M. & Rita B. Winn	6170 Brookdale Drive	Carmel CA 93923
015-241-009		Eric & Mary Coburn	6190 Brookdale Drive	Carmel CA 93923
015-241-010	066	James & Diane Schaeffler	6220 Brookdale Drive	Carmel CA 93923
015-241-011	067	Winger Family Trust	6250 Brookdale Drive	Carmel CA 93923
015-231-001	068	Marjorie Sternfield Seltzer	2852 Jackson Street	Alameda, CA 94501
015-231-002	069	Dixie P. Frincke	6290 Brookdale Drive	Carmel CA 93923

AP NO	MP NO	OWNER	ADDRESS	CITY
015-231-003		Harry & Susan Rogers	6310 Brookdale Drive	Carmel CA 93923
015-231-004	071	Soskin-Penn Trust	6330 Brookdale Drive	Carmel CA 93923
AP NO	MP NO	OWNER	ADDRESS	CITY
015-231-005	072	Stephen & Lisa Barkalow Trust	6350 Brookdale Drive	Carmel, CA 93923
157-031-020	073	Quail Lodge Inc. C/O Peninsula Quail Lodge Inc.	8205 Valley Greens Drive	Carmel Valley CA 93923
015-231-006	074	Gary E. & Jane E. Gray	6370 Brookdale Drive	Carmel CA 93923
015-231-007	075	Brent Waldman Trust	262 El Dorado Street Ste. 300	Monterey CA 93940
015-231-008	076	Robert & Denise OToole	6410 Brookdale Drive	Carmel CA 93923
015-231-009	077	John K. & Momoyo Ishizuka	6430 Brookdale Drive	Carmel CA 93923
015-231-010	078	Charles & Lisa Warner	6450 Brookdale Drive	Carmel CA 93923
015-221-001	079	Amanda Horn	6470 Brookdale Drive	Carmel CA 93923
157-141-002	080	Quail Lodge Inc. C/O Peninsula Quail Lodge Inc.	8205 Valley Greens Dr.	Carmel, CA 93923
015-221-002	081	Mary & Steven Sanders	26880 Glen Place	Carmel CA 93923
015-221-003	082	Ronald & Brigitte Fuerstner	26890 Glen Place	Carmel CA 93923
015-221-004	083	William & Connie Pringle	7004 Valley Greens Cir.	Carmel, CA 93923
015-221-005	084	Joyce Lake-Evans	P.O. Box 1238	Carmel CA 93921
015-221-006	085	Yasuo Ogawa	9 Winham St.	Salinas, CA 93901
015-172-006	086	Doris Day C/O Freedman Broder & Co.	2501 Colorado Ave. Ste. 350	Santa Monica CA 90404
*157-031-021	087	Quail Lodge Inc.	8205 Valley Greens Drive	Carmel Valley CA 93923
157-031-004	088	Green Meadows, Inc	8205 Valley Greens Drive	Carmel CA 93923
157-031-017	089	Green Meadows, Inc C/O Peninsula Quail Lodge, Inc	8205 Valley Greens Drive	Carmel CA 93923
157-082-011	090	Michale & Susan Mokelke	351 Old Spanish Trail	Portola Valley CA 94028
157-031-016	091	Wolter properties LTD Partnership	8000 Valley Greens Drive	Carmel CA 93923
157-121-012	092	Joseph C. & Rose M. Mello	28120 Schulte Road	Carmel CA 93923
157-031-007	093	Grenn Meadows, Inc C/O Peninsula Quail Lodge, Inc	8205 Valley Greens Drive	Carmel CA 93923
169-221-005	094	Wolter Properties LTD Partnership	7200 Carmel Valley Road	Carmel CA 93923
169-221-014	095	Charles & Sandra Thomason	P.O. Box 648	Pacific Grove, CA 93950
169-221-012	095A	California-American Water Company	P.O. Box 5600	Cherry Hill, NJ 08034
169-221-017	096	Cañada Woods LLC	2049 Century Park E. Suite 2500	Los Angeles, CA 90067
169-211-044	097	Clarke E. & Sandra H. Herbert	27232 Prado Del Sol	Carmel CA 93923
169-211-043	098	Edward Greco/ N. Jimee	27228 Prado Del Sol	Carmel CA 93923
169-211-042	099	Luis Zabala	550 Hartnell St. Ste. G	Monterey, CA 93940
169-211-041	100	Robert & Heather Gardner	27236 Prado Del Sol	Carmel CA 93923
416-571-016	101	Richard Spencer	P.O. Box 5400	Carmel, CA 93921
416-571-018	101A	Craig & Carol Vetter	P.O. Box 223820	Carmel CA 93922
169-201-027	102	San Pancho S De R Inmobilaria	P.O. Box 33710	Laughlin, NV 89028
416-022-001	103	Michael Hatfield	27680 Schulte Road	Carmel CA 93921
416-022-002	104	Michael Hatfield	27680 Schulte Road	Carmel CA 93921
169-201-026	105	Steck-Yee Family Trust	27205 Meadows Road	Carmel, CA 93923
169-201-013	106	John & Patricia C. Bernardi	27195 Meadows Road	Carmel CA 93923
416-022-003	107	Gary Delahanty & Melissa McCluskey	P O Box 222815	Carmel CA 93922
416-022-004	108	Rex & Debora Raymond	27640 Schulte Road	Carmel Valley, CA 93924
416-022-015	109	M. Bliss Croonquist	1220 8th St	Monterey CA 93940
169-201-012	110	Carpenter Family Joint Living Trust	27185 Meadows Road	Carmel CA 93923
169-201-028	111	Sherry DeBoer	27179 Meadows Rd.	Carmel, CA 93923
169-201-029	112	Larry & Sharon Bacon	27175 Meadows Road	Carmel, CA 93923
416-022-014	113	Sayad Family Trust	27645 Schulte Road	Carmel CA 93923
169-201-003	114	Jane Carol Probstmeyer	27165 Meadows Road	Carmel CA 93923
416-022-027	115	Mary Burton Lambert	27616 Schulte Road	Carmel CA 93923
416-022-028	115A	John L. King	P.O. Box 2648	Carmel CA 93921
416-022-006	116	Conny M. McGowan	P.O. Box 222751	Carmel CA 93922
416-022-023	117	Columbia Pacific Investors Inc.	P.O. Box 221113	Carmel CA 93922
169-411-007	118	Delapa Shaw Family Trust	1160 Hoffman Ave	Monterey CA 93940
169-191-009	119	Arthur & Kimberlee Martin	27592 Schulte Rd	Carmel CA 93923
169-191-019	120	Meredith Crowell Camp	P.O. Box 223780	Carmel CA 93922
169-411-006	121	Steven Cox & Deborah May	7542 Fawn Court	Carmel CA 93923
169-411-005	122	Donald Drummond	7543 Fawn Court	Carmel CA 93923
169-191-028	123	Robert & Marcy Rustad	7938 Carmel Valley Road	Carmel CA 93923
169-191-018	124	Douglas & Lisa Steiny	27560 Schulte Rd	Carmel CA 93923
169-191-012	125	Douglas & Lisa Steiny	27560 Schulte Rd	Carmel CA 93923
169-191-027	126	Marjorie R. Kohler	7944 Carmel Valley Road	Carmel CA 93923
169-191-004	127	Alan & Nancy Koontz	27544 Schulte Road	Carmel CA 93923
169-191-022	128	Kevin & Michelle Azevedo	7980 Carmel Valley Road	Carmel CA 93923
169-191-021	129	Daniel & Josephine Clark Trust	3508 Greenfield Pl.	Carmel CA 93923
169-191-025	130	Jeffrey & Susan Champlin	27548 Schulte Road	Carmel Valley, Ca 93924
169-191-024	131	Scott Shaffman & Susanne Stauss	27552 Schulte Road	Carmel CA 93923
169-181-002	132	Daniel & Josephine Clark Trust	3508 Greenfield Pl.	Carmel CA 93923
169-181-039	133	Thomas Joseph Noto	31 Soledad Drive Suite B	Monterey Ca 93940
169-181-040	134	Edward & Nancy Broderick	27515 Via Sereno	Carmel CA 93923
169-181-007	135	Daniel & Josephine Clark Trust	3508 Greenfield Pl.	Carmel CA 93923
169-181-041	136	Donald O. & Mary D. MacVicar	27525 Via Sereno	Carmel CA 93923
169-181-042	137	Sebastian & Antoinette Crivello	27535 Via Sereno	Carmel CA 93923
169-181-045	138	All Saints Parish Carmel-By-The-Sea C/O All Saints Episcopal Day	8060 Carmel Valley Rd	Carmel, CA 93922
169-181-021	139	Cal-Am Water Company	P.O. Box 5600	Cherry Hill, NJ 08034
169-181-050	140	William & Joan Mack	9371 Holt Rd.	Carmel CA 93923
169-181-049	140 A	Neil Ticker & Jan Hedrick	27340 Schulte Rd	Carmel Ca 93923
169-181-048	140 B	Peter A. & Kimberly D. Ruiz	27360 Schulte Road	Carmel CA 93923
169-181-047	140 C	Paul Eid Trust	PO Box 5472	Carmel CA 93921
169-181-016	141	David & Tina Gerow	27460 Schulte Road	Carmel CA 93923
AP NO	MP NO	OWNER	ADDRESS	CITY
169-181-004	142	Matthew & Tawni Farmer	P.O. Box 1265	Carmel CA 93924
169-181-012	143	Kenneth & Robyn Rauh	27440 Schulte Road	Carmel CA 93923
169-181-013	144	Bard & Barbara Lee Sherman 2006 Trust	27430 Schulte Road	Carmel CA 93923
169-181-014	145	Larry Parrish	27420 Schulte Road	Carmel CA 93923

AP NO	MP NO	OWNER	ADDRESS	CITY
169-181-017	146	Lea & Teresa Magee	27400 Schulte Road	Carmel CA 93923
169-171-009	147	John Hackbarth	3770 Wentleigh St.	Eugene OR 97405
416-023-018	148	Barbara Sherman 2006 Trust	27415 Schulte Road	Carmel CA 93923
416-023-019	149	Stephanie Workman	27401 Schulte Rd	Carmel CA 93923
416-023-020	150	Ross & Karen Heitkamp	2044 Carol Ave	Mountain View, CA 94040
169-171-008	151	Big Sur Land Trust	P.O. Box 221864	Carmel CA 93922
169-171-007	152	Nicole Griffin Trust	61 Carpenter Dr.	Hollister CA 95023
169-171-053	153	Douglas & Brenda Starr	27375 Schulte Rd.	Carmel, Ca 93923
169-171-054	154	Gunnar & Eleonore Reimers	P.O. Box 35	Carmel CA 93921
169-171-055	155	Gunnar & Eleonore Reimers	P.O. Box 35	Carmel CA 93921
416-028-027	156	Gary & Ingrid Brant	8720 River Meadow Road	Carmel CA 93923
169-161-020	157	Robert Warcken/ Janet Donahue	P.O. Box 49	Big Sur CA 93920
169-161-032	158	Nancy Roberts & Timothy Connell	8594 Carmel Valley Rd	Carmel CA 93923
169-161-034	159	Peter & Peggy Jones	8596 Carmel Valley Road	Carmel CA 93923
169-161-014	160	Marion Engstrom	110 Lomita Drive	Mill Valley CA 94941
169-161-035	161	Madeleine Wright	P.O. Box 1476	Pebble Beach CA 93953
169-161-002	162	Madeleine Wright	P.O. Box 1476	Pebble Beach CA 93953
416-028-018	163	Paul & Wendy File	8630 River Meadow Road	Carmel CA 93923
416-028-017	163A	Tom & Judy DeRegt Trust	8640 River Meadow Road	Carmel CA 93923
416-028-016	163B	Frederick & Deborah Bates	8650 River Meadow Road	Carmel CA 93923
416-028-015	163C	Peter & Karla Boynton	P.O. Box 164	Glenbrook NV 89413
169-161-003	164	KBKM Investments LLC	8870 Carmel Valley Rd	Carmel CA 93923
169-151-022	165	Coastal Cypress Corp Attn: Robert Brower	P.O. Box 22918	Carmel CA 93922
169-151-009	166	Bill C. & Dorothy D. Dick	8990 Carmel Valley Road	Carmel CA 93923
169-151-008	167	Gus & Jean Premutati Living Trust	9070 Carmel Valley Road	Carmel CA 93923
416-028-014	168	William & Danvers Simmons	930 Tahoe Blvd. Suite 802-372	Incline Village NV 89451
416-028-013	168A	Thomas Thorning & Dixie Baker	8690 River Meadows Road	Carmel CA 93923
416-028-024	168B	Cape Ann Ventures	7301 N FM 620 N STE 155-330	Austin TX 78726
169-151-006	169	William F Lemos	27010 Meadows Road	Carmel CA 93923
169-151-025	170	Thomas H. Hawley 2000 Trust	P.O. Box 805	Carmel CA 93921
169-151-014	171	William Willis 2005 Trust	9196 Carmel Valley Road	Carmel, CA 93923
*416-028-001	172	Russell Wolter	7200 Carmel Valley Road	Carmel CA 93923
*416-028-002	173	Korean Buddhist Sambosa	28110 Robinson Cyn Road	Carmel CA 93923
169-141-005	174	Gordon & Kathleen Lutes	9390 Carmel Valley Road	Carmel CA 93923
*416-028-003	175	Carmel Unified School District	PO Box 222700	Carmel CA 93922
416-028-025	176	Gary Brant	8720 River Meadow Road	Carmel CA 93923
416-028-026	176B	Gary Brant	8720 River Meadow Road	Carmel CA 93923
416-024-028	177	Laurie Hara	14563 Eastwood Drive	Los Gatos CA 95032
169-131-018	179	Vera L. Chandler-Heaston	28092 Robinson Canyon Road	Carmel CA 93923
169-131-019	180	Daniel & Laura Lewis	28090 Robinson Canyon Road	Carmel, CA 93923
169-131-023	181	Cal-Am Water Company	P.O. Box 5600	Cherry Hill, NJ 08034
169-131-020	182	Kazuko Bostock	28060 Robinson Canyon Road	Carmel CA 93923
169-131-021	183	Alexander S. & Jeanne L. Hale	28040 Robinson Canyon Road	Carmel CA 93923
169-131-014	184	Roy & Jeanelle Kaminske	P.O. Box 22096	Carmel CA 93922
416-024-012	185	Richard D. & Betty J. Kirk	60321 Jolon Road	King City CA 93930
416-024-013	186	Angee & Darrin Mooneyham	28000 Robinson Canyon	Carmel Valley, CA 93923
169-131-015	187	Donald E. Vermeil	1970 Webster Street	Palo Alto CA 94301-4047
169-091-048	189	Wind Hotels Holdings Inc	345 Park Ave.	New York NY 10154
416-522-005	190	Wardens Rector & Vestry Men of Saint Dunstan's Parish	P.O. Box 101	Carmel Valley CA 93924
416-522-004	190A	Wind Hotels Holdings Inc	P.O. Box 396	Boca Raton FL 33429
416-522-021	191	Wind Hotels Holdings Inc	P.O. Box 396	Boca Raton FL 33429
169-121-003	192	Carmel Unified School District c/o Judy Long	PO Box 222700	Carmel CA 93922
169-111-018	193	Carmel Unified School District c/o Judy Long	PO Box 222700	Carmel CA 93922
169-111-022	194	John F. Setchell	3 Scarlett Road	Carmel Valley CA 93924
169-111-008	195	Cal-Am Water Company	P.O. Box 5600	Cherry Hill, NJ 08034
169-111-007	196	Carol Kurtz	316 Mid Valley Center	Carmel Valley CA 93924
169-111-034	197	Eric Tunis	8 Scarlett Road #A	Carmel Valley CA 93924
169-111-033	197A	Stoffers-Kurtz 2007 Trust	316 Mid Valley Center #214	Carmel Valley CA 93924
*416-541-063	198	Ranchhouse Place Association	P.O. Box 2050	Morgan Hill Ca 95037
416-542-036	199	Oakshire Owners Association	PO Box 794	Carmel CA 93921
169-111-024	200	Nancy Nicholson,Succs-TR C/O School of Interdisciplinary Studies	P.O. Box 648	Oxford, OH 45056
185-031-009	201	Michael & Kira Whitaker	P.O. Box 4118	Carmel CA 93921
185-041-028	202	Patricia Womble	10 Scarlett Road	Carmel Valley CA 93924
185-031-017	203	Whitaker 2003 Family Trust	22 Scarlett Road	Carmel Valley CA 93924
185-031-007	204	John Ramsey/ Cynthia Scarlett	P.O Box 22572	Carmel CA 93922-9460
185-031-006	205	David J. Friedli & Lee Evans	P.O Box 1876	Carmel CA 93922
185-031-005	206	Michael Curtice & TM Turner	25 Scarlett Road # C	Carmel Valley CA 93924-9439
185-021-017	207	Scott & Meredith Manhard	2 Ronnoco Road	Carmel Valley, CA 93924
185-021-018	208	Timothy K. & Lynn Allen	P.O. Box 5014	Carmel CA 93921
185-021-030	209	A. Martin & Mary E. Schlarmann	6 Ronnoco Road	Carmel Valley CA 93924
185-021-025	210	Doyle & Mary Moses	10 Ronnoco Road	Carmel Valley CA 93924
185-021-026	211	Marian & Paul Lucido	12 Ronnoco Road	Carmel Valley CA 93924
AP NO	MP NO	OWNER	ADDRESS	CITY
185-021-027	212	Richard C. Kauffman & Karin Strasser	14 Ronnoco Road	Carmel Valley CA 93924
185-021-028	213	R & K Harris Family Trust	16 Ronnoco Road	Carmel Valley CA 93924
185-021-010	214	Rosemary Luke	920 W. Carmel Valley Road	Carmel Valley CA 93924
185-021-032	215	Dennis & Susan Jones	916 W. Carmel Valley Road	Carmel Valley CA 93924
185-021-033	215A	Pius Family Trust	P.O. Box 1129	Carmel Valley CA 93924
185-021-034	215B	George W. & Lynn L. Jordan	914 W Carmel Valley Road	Carmel Valley CA 93924
416-511-002	216	Dr. Jabir & Sara Adamo	2129 Furner Drive	El Cajon CA 92020
416-027-023	217	Julie Ann Clausen	P.O. Box 222543	Carmel CA 93922
416-027-022	218	Gerry Paddock	910 W. Carmel Valley Road	Carmel Valley CA 93924
416-027-025	219	John T. & Alice Randazzo	906 W. Carmel Valley Road	Carmel Valley CA 93924
416-027-043	220	Don R. Koontz	P.O. Box 289	Carmel Valley CA 93924
416-027-047	221	Monterey Peninsula Regional Park Dist.	60 Garden Ct., Ste. 325	Monterey, CA 93940

Exhibit 2- Property Owners

AP NO	MP NO	OWNER	ADDRESS	CITY
416-511-005	222	Monterey Peninsula Regional Park Dist.	60 Garden Ct., Ste. 325	Monterey, CA 93940
187-051-002	223	Monterey Peninsula Regional Park Dist.	60 Garden Ct., Ste. 325	Monterey, CA 93940
187-051-008	224	County of Monterey/Dept of Public Works	312 E. Alisal Street	Salinas CA 93901
189-011-045	225	Monterey Peninsula Regional Park Dist.	60 Garden Ct., Ste. 325	Monterey CA 93940
189-011-026	226	County of Monterey/Dept of Public Works	312 E. Alisal Street	Salinas CA 93901
189-011-025	227	George & Marianne Lino	600 W Carmel Valley Road	Carmel Valley CA 93924
189-011-023	228	Mary M. Shaw	580 California St. Ste. 1900	San Francisco CA 94104
189-012-002	229	Jonathan & Mary Sutherland	550 W. Carmel Valley Rd.	Carmel Valley, CA 93924
189-012-001	230	Carmel River Stables	P.O. Box 19909	Sacramento CA 95819
189-011-042	231	Camille Penhoet	2000 Grandview Drive	Napa CA 94558
189-011-037	232	Edward & Camille Penhoet	688 Alvarado St	Berkeley CA 94705
189-561-034	233	Moein Family Trust	PO Box 8969	Calabasas CA 91372
189-561-032	234	Accustom Development	465 Tyler St	Monterey CA 93940
189-561-031	235	Brenda Snow	13 Paso Del Rio Road	Carmel Valley CA 93924
189-021-007	236	Virginia Bell	330 S. Poplar Ave	Pierre, SD 57501-2495
189-561-030	237	Phyllis D. Reade	44 W. Garzas Road	Carmel Valley CA 93924
189-031-016	238	Victor & Margaret Greco	396 W. Carmel Valley Road	Carmel Valley CA 93924
189-031-017	239	Roderick & Leslie A. Mills	392 W. Carmel Valley Road	Carmel Valley CA 93924
189-561-029	240	Cal-Am Water Co/Att: Larry Foy	PO Box 5600	Cherry Hill, NJ 08034
189-561-025	241	Dennis & Kathleen Burke	90 W. Garzas Road	Carmel Valley CA 93924
189-041-007	242	Jack Schwadron	390 W. Carmel Valley Road	Carmel Valley CA 93924
189-101-001	243	Dominic & Jakie Favalora	89 W. Garzas Rd.	Carmel Valley CA 93924
189-041-005	244	Wolfgang & Kathleen Baer	380 W Carmel Valley Road	Carmel Valley CA 93924
189-101-002	245	Kenneth & Martha Nava	85 West Garzas Road	Carmel Valley CA 93924
189-101-003	246	William & Joele Swift	1 Sleepy Hollow Dr	Carmel Valley, CA 93924
189-041-006	247	Caotco Inc	PO Box 1613	Carmel Valley, CA 93924
189-101-004	248	Homer Bosserman III/Homer Bosserman L. Jr.	77 W Garzas Road	Carmel Valley CA 93924
189-101-005	249	Alec & Harriett Duarte	73 W. Garzas Road	Carmel Valley CA 93924
189-051-001	250	Abadir Bush & Co. Inc.	340 W. Carmel Valley Rd	Carmel Valley, CA 93924
189-101-006	251	Donald E. & Serena C. Underwood	West Garzas Road	Carmel Valley CA 93924
189-101-007	252	E. Rosenberg & C. Miles	65 W Garzas Rd	Carmel Valley, CA 93924
189-051-002	253	Robert & Katherine Manson	28057 Hawk Ct	Carmel Valley, CA 93923
189-071-020	254	Arthur & Gerry Montgomery	34 Aliso Road	Carmel Valley CA 93924
189-101-008	255	Kevin J. Gilman Trust	22 Trampa Canyon	Carmel Valley CA 93924
189-071-019	256	Abraham Kryger	32 Aliso Rd	Carmel Valley Ca 93924
189-101-009	257	Alfred & Stella Mohr	57 W. Garzas Road	Carmel Valley CA 93924
189-071-015	258	Adams Family Trust	28 Aliso Road	Carmel Valley CA 93924
189-071-014	259	Clem S. Savoldi Sr.	26 Aliso Rd	Carmel Valley CA 93924
189-091-001	260	Donald & Lisa Barnett	9 Via Poca	Carmel Valley CA 93924
189-071-013	261	Glen T. Nakamura	18 Aliso Road	Carmel Valley CA 93924
189-091-002	262	Michael & Janice Tancredi	801 Lighthouse Ave. Ste. 109	Monterey CA 93940
189-071-012	263	Abraham Kryger	32 Aliso Road	Carmel Valley CA 93924
189-091-017	264	John & Denise Guzik	45 W. Garzas Road	Carmel Valley CA 93924
189-091-016	265	Leslie & Joseph Strickland	41 W. Garzas Road	Carmel Valley CA 93924
189-071-022	266	Hugh & Audrey Pierson	14 Aliso Road	Carmel Valley CA 93924
189-091-012	267	Willis & Patricia Condren	37 W. Garzas Road	Carmel Valley CA 93924
189-071-021	268	Donna R. Dougherty	P.O. Box 3637	Carmel CA 93921
189-091-005	269	Donald & Lisa Barnett	9 Via Poca	Carmel Valley CA 93924
189-082-008	270	Stephen & Barbara Quinn	8 Aliso Road	Carmel Valley CA 93924
189-091-006	271	Marilyn Asher Trust	5 Via Poca	Carmel Valley CA 93924
189-082-006	272	Jack & Marie M. Seliskar	59 Boronda Road	Carmel Valley CA 93924
189-091-007	273	Wildcat Properties LLC	4800 College Blvd. Ste. 204	Farmington NM 87402
189-091-008	274	William V. & Norma J. King	9 W. Garzas Road	Carmel Valley CA 93924
189-082-005	275	Michael Sosnowski	P.O. Box 2167	Monterey, CA 93942
189-091-009	276	William V. & Norma J. King	9 W. Garzas Road	Carmel Valley CA 93924
189-082-004	277	Gary & Cheryl Fife	89 Boronda Road	Carmel Valley, CA 93924
189-091-010	278	Evelyn J. Zoellin	5 W. Garzas Road	Carmel Valley CA 93924
189-091-011	279	Nancy E. Rushmer	95 Boronda Road	Carmel Valley CA 93924
189-082-003	280	Shawn Anderson	93 Boronda Road	Carmel Valley CA 93924
189-141-002	281	Stein Hoffmoen/Eloise Yamamoto	100 Stadler Drive	Woodside CA 94062
189-141-003	282	Shanti E. Heard Trust	P.O. Box 1367	Carmel Valley CA 93924
189-083-005	283	Lester Gorn	220 9th St	Pacific Grove, CA 93950
189-141-004	284	James Morris/ Alice SJT	9 E. Garzas Road	Carmel Valley CA 93924
189-083-004	285	Frederick & Catharina Pomeroy	88 Boronda Road	Carmel Valley CA 93924
AP NO	MP NO	OWNER	ADDRESS	CITY
189-141-005	286	S & T McGowan Family Trust	13 E. Garzas Road	Carmel Valley CA 93924
189-141-016	287	Anton Guerra	17 E. Garzas Road	Carmel Valley CA 93924
189-141-017	288	Shari Ann Higashi	P.O. Box 4395	Salinas CA 93912
189-181-010	289	Nancy & Charles Abildgaard	18 Meadow Place	Carmel Valley CA 93924
189-141-008	290	William & Shirley Allen	27 E Garza Rd	Carmel Valley CA 93924
189-181-015	291	Thomas & Margaret Oliver	10 Meadow Place	Carmel Valley CA 93924
189-141-009	292	Marion Holly Decker	31 E. Garzas Road	Carmel Valley CA 93924
189-141-010	293	Johne & Nathelia Hungerford	37 E. Garzas Road	Carmel Valley CA 93924
189-141-011	294	Kenneth & Margaret Popovich	41 E. Garzas Road	Carmel Valley CA 93924
189-181-011	295	Kenneth & Margaret Popovich	41 E. Garzas Road	Carmel Valley Ca 93924
189-181-008	296	Thomas & Margaret Oliver	10 Meadow Place	Carmel Valley CA 93924
189-131-009	297	Richard and Cynthia Graves	43 E. Garzas Road	Carmel Valley CA 93924
189-131-010	298	The Charles & Susan Franklin Living Trust	45 E. Garzas Road	Carmel Valley CA 93924
189-131-002	299	Stephen & Sivechat Hearst	5 3rd Street Ste.200	San Francisco CA 94103
189-191-008	300	Robert & Valerie Dee McKay	92 Panetta Road	Carmel Valley CA 93924
189-191-018	301	Mark S. & Deborah Kimes	100 Panetta Road	Carmel Valley CA 93924
189-131-003	302	Edward A. & Dolores McGlochlin	E. Garzas Road	Carmel Valley CA 93924
189-131-004	303	Douglas & Kimberley Campbell	59 E. Garzas Road	Carmel Valley Ca 93924
189-131-011	304	Reginald & Dorothy Jones	61 E Garzas Road	Carmel Valley CA 93924
189-191-005	306	Pearson Wilmont	P.O. Box 1445	Salinas CA 93902

AP NO	MP NO	OWNER	ADDRESS	CITY
189-131-012	307	Tricasa Investments	65 E. Garzas Road	Carmel Valley Ca 93924
189-131-006	308	Michael & Concettina Boerlin	69 E. Garzas Road	Carmel Valley CA 93924
189-131-007	309	MCSC Family Limited Partnership	P.O. Box 873	Carmel Valley CA 93924
189-131-013	310	Marie Cawley	1194 Carndano Ct	Sunnyvale CA 94087
189-121-004	311	Sunny & David Minedew Trust	4250 Ross Dr	Reno NV 89519
189-121-006	312	Steve Fox	81 E Garzas RD	Carmel Valley CA 93924
189-121-005	313	Doug Brandeburg	2770 Canyon Creek Drive	San Ramon CA 94583
189-121-001	314	Pristine Development LLC c/o Wes Christian	7020 Portwest Dr #180	Houston, TX 77024
189-111-005	315	Carmel Valley Trail & Saddle Club	PO Box 5865	Carmel CA 93921
189-261-017	316	Pristine Development LLC c/o Wes Christian	7020 Portwest Dr #180	Houston, TX 77024
189-261-010	317	Pristine Development LLC c/o Wes Christian	7020 Portwest Dr #180	Houston, TX 77024
189-261-011	318	Pristine Development LLC c/o Wes Christian	7020 Portwest Dr #180	Houston, TX 77024
189-261-012	319	Pristine Development LLC c/o Wes Christian	7020 Portwest Dr #180	Houston, TX 77024
189-261-013	320	Pristine Development LLC c/o Wes Christian	7020 Portwest Dr #180	Houston, TX 77024
189-261-006	321	Pristine Development LLC c/o Wes Christian	7020 Portwest Dr #180	Houston, TX 77024
189-261-005	322	Pristine Development LLC c/o Wes Christian	7020 Portwest Dr #180	Houston, TX 77024
189-261-004	323	Sue Bear	P.O. Box 905	Carmel Valley CA 93924
189-261-003	324	Anne Yant	P.O. Box 1361	Carmel Valley CA 93924
189-252-001	325	Anne Yant	P.O. Box 1361	Carmel Valley CA 93924
189-252-002	326	Mark Roth	85 Paso Hondo	Carmel Valley CA 93924
189-252-019	327	Terry Parker & Joseph Victorine	83 Paso Hondo	Carmel Valley, CA 93924
189-252-016	328	David & Heidi Peterson	81 Paso Hondo	Carmel Valley CA 93924
189-252-017	329	US Bank NA 2004-Z	79 Paso Hondo	Carmel Valley CA 93924
189-252-018	330	Kathleen Pfitzer	P.O. Box 222688	Carmel CA 93922
189-252-020	331	Paul & Linda Ingram	P.O. Box 354	Carmel Valley CA 93924
189-252-021	332	Nolan Family Trust	75 Paso Hondo	Carmel Valley, CA 93924
189-252-027	333	Joan M. Bard	330 Edgehill Way	San Francisco, CA 94127
189-252-026	333A	Gregory & Joan M. Bard	330 Edgehill Way	San Francisco, CA 94127
189-111-020	334	The Big Sur Land Trust	PO Box 221864	Carmel CA 93922
189-111-021	334A	Monterey Peninsula Regional Park District	60 Garden Ct., Ste. 325	Monterey, CA 93940
189-272-012	335	Monterey Peninsula Regional Park District	PO Box 935	Carmel Valley CA 93924
189-272-014	336	Jane Long	13 Paso Hondo	Carmel Valley CA 93924
189-272-009	337	Wallace & Marikay LeValley	11 Paso Hondo	Carmel Valley CA 93924
189-272-011	338	Larry Scholink	P.O. Box 223520	Carmel CA 93922
189-272-010	339	Roland & Marilee Gee	139 Steeplechase Way	Southern Pines NC 28387
189-281-005	340	County of Monterey/Dept of Public Works	312 Laurel	Salinas CA 93901
189-281-001	341	Philip Heberer	3 Paso Hondo	Carmel Valley, CA 93924
189-281-003	342	William Burleigh & Anne Hannon	1 Paso Hondo	Carmel Valley CA 93924
189-281-004	343	William & Robin Harness	P.O. Box 1957	Carmel Valley CA 93924
189-321-007	344	Monterey Pen Reg Park Dist	P.O. Box 935	Carmel Valley CA 93924
189-321-005	344A	Richard & Cathy Rosenthal	P.O. Box 1021	Carmel Valley CA 93924
189-321-006	344B	Denis Wagner	23 Lazy Oaks	Carmel Valley CA 93924
189-311-028	345	Daniel R. O'Sullivan Jr.	19 Lazy Oaks	Carmel Valley CA 93924
189-301-003	346	William & Robin Harness	P.O. Box 1957	Carmel Valley CA 93924
189-311-002	347	Nadine Costa	29134 Road 56	Visalia CA 93277
189-311-003	348	Loraine L. Swiess	33 Calle De los Helechos	Carmel Valley CA 93924
189-311-004	349	Peter & Ivana Bednarik	365 Ridge Way	Carmel Valley CA 93924
189-311-005	350	William Armstrong	13341 Martha St	Van Nuys CA 91401
189-311-006	351	Robert & Donna Jackson	27 Calle de los Helechos	Carmel Valley CA 93924
189-311-007	352	Emmy Papazian	45 Montclair Ter.	San Francisco, CA 94109
189-311-008	353	Claudia J. Bibber	21 Calle De Los Helechos	Carmel Valley CA 93924-9706
189-311-009	354	Donald Davis & Judith Webster	553 The Alameda	Berkeley CA 94707
189-311-010	355	Michael Cappetti	19-A Calle de los Helechos	Carmel Valley CA 93924
189-311-011	356	John Jerome Jones	17 Calle de los Helechos	Carmel Valley CA 93924
189-311-012	357	Mary Mahoney	15 Calle de los Helechos	Carmel Valley CA 93924
189-311-013	358	Phillip L. & Frances K. Wright	9 Calle de los Helechos	Carmel Valley CA 93924
AP NO	MP NO	OWNER	ADDRESS	CITY
189-311-016	359	Mty Co Dept of Public Works	312 E. Alisal	Salinas, CA 93901
189-301-002	360	Harness W & E 1990 Family	P.O. Box 1957	Carmel Valley CA 93924
189-543-019	361	Laguna Robles Comm Assoc Attn: Bill Bavelas	1 Annabel LN #217	San Ramon CA 94583
189-541-002	362	Rippling River Affordable Housing	123 Rico Street	Salinas CA 93907
189-342-008	363	Robles del Rio Carmelo Water Company	P.O. Box 41	Carmel Valley CA 93924
189-342-005	364	Paul F. & Wilma Cozzens	145 Paloma Way	Watsonville CA 95076-6122
189-541-027	365	Hugh & Peggy Ward	227 Salsipuedes	Carmel Valley CA 93924
189-461-001	366	Obrien Family Trust	69 El Potrero	Carmel Valley CA 93924
189-461-002	367	Stanford & Rosemary White	67 El Potrero	Carmel Valley CA 93924
189-461-003	368	David Fairhurst & Angela Wong	65 El Potrero	Carmel Valley CA 93924
189-461-004	369	Kenneth Jr & Gillian M Challenger	57 El Potrero	Carmel Valley CA 93924
189-461-005	370	Jean Sciocchetti	9040 Upper Applegate Road	Jacksonville OR 97530
189-461-006	371	Florence G.Buchenroth	53 El Potrero	Carmel Valley CA 93924
189-461-007	372	Dorothy E. Collins	PO Box 333	Carmel Valley CA 93924
189-541-026	373	Hugh & Peggy Ward	P.O. Box 2292	Monterey CA 93942
189-541-025	373A	Hugh & Peggy Ward	P.O. Box 2292	Monterey CA 93942
189-541-024	373B	Paul & Karen Turner	18 Esquiline Rd.	Carmel Valley CA 93924
189-463-004	374	Jo Chatham	9932 Holt Road	Carmel CA 93923
189-463-001	375	Patti Cunningham	43 El Potrero	Carmel Valley CA 93924
189-463-022	376	Laurie Johnson & Alem Dermicek	35 El Potrero #A	Carmel CA 93924
189-463-023	376A	Robert & Anita Reese	PO Box 4172	Carmel CA 93921
189-551-005	377	Joan Friend	55 E. Carmel Valley Road	Carmel Valley CA 93924
189-463-025	377A	Anne E. Duncan	25 Hilltop Road	San Mateo, CA 94402
189-463-005	378	Joselyn Scheid & James Brown	33 El Potrero	Carmel Valley CA 93924
189-463-019	379	Joaquin Celaya & Connie Teeter	31 El Potrero	Carmel Valley CA 93924
189-463-007	380	Robles del Rio Carmelo Water Company	P.O. Box 41	Carmel Valley CA 93924
197-101-015	381	Mary Ann Meza	P.O. Box 221003	Carmel CA 93922
197-101-016	383	PMJF LLC	P.O. Box 7608	Spreckels, CA 93962

Exhibit 2- Property Owners

AP NO	MP NO	OWNER	ADDRESS	CITY
197-101-017	383A	PMJF LLC	P.O. Box 7608	Spreckels, CA 93962
197-101-018	384	Myrleen F Fisher	55 Wawona Road	Carmel Valley CA 93924-9600
197-101-019	384A	Harry D. & Marilyn S. Raynes	2661 Tallant Rd. #C-86	Santa Barbara, CA 93105
197-151-003	385	Rancho del Robledo Association	P.O. Box 981	Carmel Valley CA 93924
197-091-034	386	Catherine Legare	23525 SW Elderberry Lane	West Linn OR 97068
197-091-033	387	Catherine Legare	23525 SW Elderberry Lane	West Linn OR 97068
197-091-032	388	Brian Carolan	1010 Malone Road	San Jose CA 95125
197-151-010	389	Aquilino & Ampelia Zarazua	P.O. Box 515	Carmel Valley CA 93924
197-151-012	390	Thomas & Christie House	9 Rancho El Robledo	Carmel Valley CA 93924
197-091-031	391	Brain Carolan	1010 Malone Road	San Jose CA 95125
197-091-030	392	John & S Machado Family Trust	140 W. Blanco Rd.	Salinas, CA 93908
197-091-029	393	Elmer Machado	140 W. Blanco Rd.	Salinas, CA 93908
197-091-028	394	James Thompson	PO Box 3016	Carmel CA 93921
197-091-027	395	Georgia Hallyburton & Leslie Casey	25 Hollins Drive	Santa Cruz CA 95060
197-091-026	396	Richard & Diane Dickson	19 Wawona Road	Carmel Valley, CA 93924
197-091-039	397	Mary Sherman & Brian Groza	24 Scarlett Road	Carmel Valley CA 93924
197-091-040	398	Bill & Linda Conlan	P.O. Box 84	Carmel Valley CA 93924
197-091-023	399	Bill & Linda Conlan	P.O. Box 84	Carmel Valley CA 93924
197-091-022	400	Margaret & Lynda Clark	2320 Funston Avenue	San Francisco CA 94116
197-151-013	401	Patrick & Martha Dundon	10 Rancho el Robledo	Carmel Valley CA 93924
197-091-021	402	Helen Kirk & Adina Garza-Pena	3511 Grim Ave	San Diego CA 92104
197-091-020	403	Justin Iles & Luana Calvano	P.O. Box 179	Big Sur CA 93920
197-091-019	404	Perilyn & Ron Gertz	P.O. Box 5695	Carmel CA 93921
197-091-018	405	William Mc Chrystal Jr.	43 Steffoni Avenue	Carmel Valley, CA 93924
197-091-017	406	Thomas Albanese	15435 Pepper Ln	Saratoga, CA 95070-6426
197-091-016	407	Thomas Albanese Living Trust	15435 Pepper Ln	Saratoga, CA 95070-6426
197-151-016	408	George S & Marcia M. Lockwood	P.O. Box 345	Carmel Valley CA 93924
197-091-014	409	Quinn Properties	15435 Pepper Ln	Saratoga, CA 95070-6426
197-151-017	410	George S. & Marcia M. Lockwood	189-561-029	Carmel Valley CA 93924
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Updated January 2008		189-561-029		